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ISAAC TAYLOR

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THE ORIGIN OF THE ARYANS.

AN ACCOUNT OF THE PREHISTORIC ETHNOLOGY AND
CIVILIZATION OF EUROPE.

BY

ISAAC TAYLOR,

M.A., Litt. D., Hon. LL.D.

ILLUSTRATED.



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PREFACE.

THE last ten years have seen a revolution in the opinion of scholars as to the region in which the Aryan race originated, and theories which not long ago were universally accepted as the well-established conclusions of science now hardly find a defender.

In Germany several works have been devoted exclusively to the subject, but no English book has yet appeared giving an account of the state of the controversy, and embodying the results recently arrived at by philologists, archæologists, and anthropologists.

The present volume does not aim at setting forth new views or speculations. It is rather a summary of the labors of many scholars, and a critical digest of the very considerable literature which has now accumulated on the subject. Its object is to present in condensed form a statement of ascertained facts, and of the arguments which have been based upon them. On the works of four scholars, Cuno, Pösche, Penka, and Schrader,* who deal specially with the subject of this book, I have freely drawn, often without specific acknowledgment. I am more especially indebted to Dr. Schrader's admirable work, which forms an almost exhaustive treasury of facts and arguments set forth in a critical and impartial spirit. To this work, an English translation of which is announced for speedy publication, the student who desires to follow out the subject may be confidently referred.

Of the anthropologists I have relied chiefly on Virchow, the greatest of the Germans, and on Broca, the greatest of the Frenchmen; but without neglecting other writers, such as Rolleston, Huxley, Thurnam, Davis, Greenwell, De Quatrefages, Hamy, and Topinard.

For archæological details constant reference has been made to

* Johann Gustav Cuno, *Forschungen im Gebiete der alten Völkerkunde*; Theodor Pösche, *Die Arier*; Karl Penka, *Origines Ariacæ* and *Die Herkunft der Arier*; O. Schrader, *Sprachvergleichung und Urgeschichte*.

Helbig's little-known but admirable book on the prehistoric civilization of Italy, as well as to the works of Keller, De Mortillet, and Boyd Dawkins.

I have obtruded my own opinions as little as possible. On the main thesis of the book they are essentially those of Spiegel and Schrader, though in several points I find myself rather in agreement with Cuno, whose ingenious work seems to be almost unknown in this country, if one may judge from the fact that I have seen it quoted in no English book, and found that it was unknown even in the British Museum.

I believe the speculation as to the relations of the Basques and Iberians is new. I have also worked out a pregnant suggestion of Dr. Thurnam's—the identification of the primitive Aryans with the "Turanian" race of the British round barrows—an hypothesis which seems to afford the most probable solution of the problem of the origin of the Aryans; and this I have combined with the philological arguments of Anderson, Weske, and Cuno, the only scholars who have effectively investigated the linguistic affinities of primitive Aryan speech.

In the chapter on Mythology, I have attempted to work out, to its legitimate conclusion, a line of argument suggested in the Hibbert Lectures of Professor Rhys.

L T.

SETTRINGTON,

December, 1889.

THE ORIGIN OF THE ARYANS.

CHAPTER I.

THE ARYAN CONTROVERSY.

WHEN towards the close of the last century Sanskrit and Zend became known to European scholars, the new science of Comparative Philology came into existence. The first stone of the edifice was laid in 1786, when Sir William Jones made the memorable declaration that the similarities between Sanskrit, Greek, Latin, German, and Celtic could only be explained on the hypothesis that these languages had a common parentage. Hegel hardly exaggerated the consequences of this discovery when he called it the discovery of a new world.

Fifty years elapsed before Bopp succeeded in establishing, as a settled conclusion of science, what had hitherto been little more than a probable hypothesis. His *Comparative Grammar*, published in 1833-35, has been superseded in its details by other works, and it has now only an historical interest. But to Bopp belongs the honor of having discovered the method of the comparison of grammatical forms, which at once placed Comparative Philology on a scientific footing. In this and subsequent works Bopp showed that Zend and Slavonic, as well as Albanian and Armenian, must be included in what he called the Indo-Germanic family of speech.

The great linguistic family, whose existence was thus established, embraces seven European groups of languages—the Hellenic, Italic, Celtic, Teutonic, Slavonic, Lithuanic or Lettic, and Albanian; in fact, all the existing languages of Europe except Basque, Finnic, Magyar, and Turkish. There are also three closely related Asiatic groups: the Indic, containing fourteen modern Indian languages derived from Sanskrit; secondly, the Iranic group, comprising Zend, Persian, Pushtu or Afghan, Baluchi, Kurdish, and Ossetic; and, thirdly, the Armenian, which is intermediate between Greek and Iranian.

No name, altogether unobjectionable, has been devised for this family of speech. Japhetic, modeled after the pattern of Semitic and

Hamitic, involves the assumption of a descent from Japhet. Caucasian is both too narrow and too broad, and, if used at all, is applicable to race rather than to language. Sanskritic gives undue prominence to one member of the group. Indo-Germanic and Indo-European are not only clumsy, but inaccurate. The first, adopted by Bopp, is a favorite term in Germany; but French and Italian scholars see no reason why German should be taken as the type of European speech. Indo-European, which they prefer, is too narrow, since it excludes Iranian and Armenian, and too broad, since the languages in question are spoken only in a part of India and a part of Europe.

ARYAN, a term invented by Professor Max Müller, is almost as objectionable as Sanskritic, since it properly designates only the Indo-Iranian languages, in which sense it is used by many continental scholars. Moreover, it tacitly implies or suggests that the ancient Ariana, the district round Herat, was the cradle of the Aryan languages, and thus begs the whole question of their European or Asiatic origin. However, since the term has the great merit of being short and compact, and since it is almost universally adopted by English writers, and is increasingly used in France and Germany, it will, in spite of its manifold demerits, be employed in the ensuing pages.

We have already seen that Comparative Philology, as a science, dates from the publication of Bopp's *Comparative Grammar* in 1835. But this great achievement was not without its Nemesis. When Bopp had demonstrated that the greater number of the languages of Europe and some languages of Asia must be referred to a common ancestral speech, there was a tendency to assume, as a matter of course, that the speakers of these languages were also themselves descended from common ancestors. From a primitive unity of speech scholars hastily inferred a primitive unity of race.

Professor Max Müller, owing to the charm of his style, to his unrivaled power of popular exposition, and to his high authority as a Sanskrit scholar, has done more than any other writer to popularize this erroneous notion among ourselves. Thus, in his *Lectures on the Science of Language*, delivered in 1861, instead of speaking only of a primitive Aryan language, he speaks of an "Aryan race," an "Aryan family," and asserts that there was a time "when the first ancestors of the Indians, the Persians, the Greeks, the Romans, the Slaves, the Celts, and the Germans were living together within the same inclosures, nay, under the same roof," and he argues that, because the same forms of speech are "preserved by all the members of the Aryan family, it follows that before the ancestors of the Indians and Persians started for the South, and the leaders of the Greek, Roman, Celtic, Teutonic, and Slavonic colonies marched towards the shores of Europe, there was a small clan of Aryans, settled probably on the highest elevation of Central Asia, speaking a language not yet

Sanskrit, or Greek or German, but containing the dialectical germs of all."*

Than this picturesque paragraph more mischievous words have seldom been uttered by a great scholar. Professor Max Müller's high reputation has been the means of impressing these crude assumptions, which he would now doubtless repudiate, upon his numerous disciples.† In England, at all events, such misconceptions are still widely prevalent, and our popular writers persistently ignore the labors of those French and German scholars who, during the last quarter of a century, have been offering more scientific explanations of the great fact of the fundamental unity of the Aryan languages. They have shown conclusively that the assumption of the common ancestry of the speakers of Aryan languages is a mere figment, wholly contrary to the evidence, and as improbable as the hypothesis that a small Aryan clan in Central Asia could have sent out great colonies which marched four thousand miles to the shores of Europe.

It cannot be insisted upon too strongly that identity of speech does not imply identity of race, any more than diversity of speech implies diversity of race. The language of Cornwall is the same as the language of Essex, but the blood is Celtic in the one case and Teutonic in the other. The language of Cornwall is different from that of Brittany, but the blood is largely the same. Two related languages, such as French and Italian, point to an earlier language from which both have descended; but it by no means follows that French and Italians, who speak those languages, have descended from common ancestors. The most inexperienced eye can distinguish between a Spaniard and a Swede, and yet both speak Aryan tongues, and even in Northern and Southern Germany there is a manifest difference of race, though the language is the same.

The old assumption of the philologists, that the relationship of language implies a relationship of race, has been decisively disproved and rejected by the anthropologists. The ultimate unity of the human race may be admitted, but Professor Max Müller has maintained a nearer kinship of all speakers of Aryan languages. He has asserted that the same blood runs in the veins of English soldiers "as in the veins of the dark Bengalese," and has had the courage to affirm that "there is not an English jury nowadays which, after examining the hoary documents of language, would reject the claim of a common descent and a legitimate relationship between Hindu,

* Max Müller, *Lectures*, 1st Series, pp. 211, 212.

† These opinions are still held by writers of repute. Thus, in 1884, Canon Cook affirmed that "it is a fact, scientifically demonstrated, that the ancestors of all the families belonging to this (the Aryan) race must have dwelt together as one community after their separation from the Semitic and Hamitic branches."—Cook, *Origins of Religion and Language*, p. 312.

Greek and Teuton."* Coming from such a source, this statement cannot be passed over as it might be if it came from a less eminent authority. It will be admitted that the language spoken by the negro in Alabama resembles the language spoken by the New Englander of Massachusetts far more nearly than the language spoken by the English soldier resembles that of the Bengal sepoy with whom he is brigaded, and the evidence derived from the documents of language—in this case not hoary—which might be put before an English jury as to a "common descent," and a "legitimate relationship" between the negro and the Yankee, would be far more intelligible to the twelve English tradesmen in the box than the more obscure evidence which applies to the case of the Teuton and the Hindu. Such rash assertions are calculated to discredit, and have discredited, the whole science of Comparative Philology, and those who have given them the authority attached to influential names must be charged with having retarded for twenty years in England the progress of the science of Comparative Ethnology.†

To the French anthropologists, and more especially to Broca, belongs the credit of raising a needful protest against the overweening claims of the philologists. He observes that "races have frequently within the historic period changed their language without having apparently changed the race or the type. The Belgians, for instance, speak a neo-Latin language; but of all the races who have mingled their blood with that of the autochthones of Belgium it would be difficult to find one which has left less trace than the people of Rome." Hence, he continues, "the ethnological value of comparative philology is extremely small. Indeed, it is apt to be misleading rather than otherwise. But philological facts and deductions are more striking than minute measurements of skulls, and therefore the conclusions of philologists have received undue attention."‡

These warning words are still neglected, the speakers of Aryan languages are assumed to constitute an Aryan race, and the question is debated, where did this Aryan race originate?

It is now contended that there is no such thing as an Aryan race in the same sense that there is an Aryan language, and the question of late so frequently discussed as to the origin of the Aryans can only mean, if it means anything, a discussion of the ethnic affinities of those numerous races which have acquired Aryan speech; with the further question, which is perhaps insoluble—among which of these

* Max Müller, *Survey of Languages*, p. 29.

† Thus in a recent work Professor Rawlinson quotes the foregoing appeal to the English jury, "from the greatest of modern ethnologists," as the "result of advanced modern inductive science," which has "proved beyond all reasonable doubt" the common origin of the nations which speak Aryan languages.—Rawlinson, *Origin of Nations*. (No. 25 Humboldt Library.)

‡ Broca, *La Linguistique et l'Anthropologie*, p. 259.

races did Aryan speech arise, and where was the cradle of that race?

To the same effect, Topinard, a distinguished follower of Broca, remarks that it has been proved that the anthropological types in Europe have been continuous, and if the Aryans came from Asia they can have brought with them nothing but their language, their civilization, and a knowledge of metals. Their blood has disappeared. In France, he continues, we are Aryans only by speech. By race we are mainly Cymry in the north, and Celts in the central region.*

Thirty years ago this question as to the cradle of the Aryan race was deemed a reasonable question to ask, and a possible one to answer. It was even believed that it had received a final and definite solution. European scholars, with hardly an exception, were agreed that the cradle of what they were pleased to call the Aryan race must be sought in Central Asia on the upper waters of the Oxus.

There is hardly a more instructive chapter in the whole history of scientific opinion than that which deals with the arguments on which this conclusion was based, and with the counter arguments which have led, during the last few years, to its general abandonment.

At the beginning of the present century, and even so recently as thirty years ago, the chronology of Archbishop Usher was accepted without question, the origin of the human race being assigned to the year 4004 B. C. It was believed that the primeval language spoken by our first parents was Hebrew,† and that the origin of the languages of Europe must be referred to the family of Japhet, who set forth from the plains of Shinar in the year 2247 B. C.

This theory, based on the belief that the human race originated in Asia at a comparatively recent period, and that the diversity of human speech dates from the confusion of tongues at Babel, was universally accepted. It was maintained, for instance, by Vans Kennedy‡ in 1828, by Dr. Kitto || in 1847, and by Canon Cook § as late as 1884, as well as by a host of less influential writers.

In a somewhat modified form this opinion is still held. Mommsen, in 1874, adhered to the valley of the Euphrates as the primitive seat of the Indo-Germanic race,¶ and the same theory was advocated in 1888 by Dr. Hale, in a paper read before the Anthropological Section of the American Association for the advancement of Science.**

Adelung, the father of Comparative Philology, who died in 1806,

* Topinard, *L'Anthropologie*, p. 444. † Gill, *Antiquity of Hebrew*, p. 44.

‡ Kennedy, *Researches into the Origin and Affinity of the principal Languages of Europe and Asia*.

|| In Knight's *Pictorial Bible*, vol. i. p. 38.

§ Cook, *Origins of Religion and Language*, p. 314.

¶ Mommsen, *Romische Geschichte*, vol. i. p. 30.

** *Popular Science Monthly*, vol. xxxiv. p. 674, March 1889.

placed the cradle of mankind in the valley of Cashmere, which he identified with Paradise. To Adelung we owe the opinion, which has prevailed so widely, that since the human race originated in the East, the most westerly nations, the Iberians and the Celts, must have been the first to leave the parent hive.

As soon as the archaic character of Zend, and its close relation to Sanskrit, had been recognized, it was seen that the Cashmere hypothesis of Adelung was untenable, and that the Indians and Iranians must at one time have occupied in common some northern region, from which the Indians penetrated into the Punjab. The hypothesis, which for half a century was generally accepted, that Central Asia was the cradle of the Indo-European race, was first propounded in 1820 by J. G. Rhode. His argument was based on the geographical indications contained in the first chapter of the *Vendidad*, which pointed not obscurely to Bactria as the earlier home of the Iranians.

In view of the enormous extension of time which is now demanded for the evolution and differentiation of the Aryan languages, these arguments lose their cogency; but they were sufficient to obtain the accession of W. von Schlegel, who nearly at the same time declared himself an adherent of Rhode's hypothesis. But the general acceptance of this theory by European scholars was chiefly due to the great authority of Pott. The reasoning of this eminent scholar is an instructive example of the way in which the imagination can be influenced by a mere metaphor. Pott's argument, if it can be called an argument, is based upon the aphorism—*ex oriente lux*. The path of the sun must be the path of culture. In Asia, he declares, or nowhere, was the schoolhouse where the families of mankind were trained. He fixes on the region watered by the Oxus and Jaxartes, north of the Himalaya and east of the Caspian, as the true cradle of the Indo-European race. Klaproth and Ritter supported this conclusion by a futile attempt to identify the names of the European nations with certain frontier tribes mentioned by Chinese historians. In 1847 Lassen declared his adherence to the view of Pott on the ground that the Sanskrit people must have penetrated into the Punjab from the northwest through Cabul, and that the traditions of the Avesta point to the slopes of the Belurtag and the Mustag as the place of their earlier sojourn. That before their separation the Indo-Iranians were nomad herdsmen, inhabiting the steppes between the Oxus and the Jaxartes, is not improbable, but in view of the philological arguments which establish the comparatively late date of the separation of the Indian and Iranian stems, it is now seen that the admission of a Bactrian home for the Indo-Iranians has little bearing on the question.

In the following year (1848) this opinion received the powerful support of Jacob Grimm, who calmly lays it down as an accepted conclusion of science, which "few will be found to question," that

"all the nations of Europe migrated anciently from Asia ; in the vanguard those related races whose destiny it was through moil and peril to struggle onwards, their forward march from east to west being prompted by an irresistible impulse, whose precise cause is hidden in obscurity. The farther to the west any race has penetrated so much the earlier it must have started on its pilgrimage, and so much the more profound will be the footprints which it impressed upon its track."*

In 1859 Professor Max Müller, in his *History of Ancient Sanskrit Literature*, adopted, with sundry poetic embellishments, Grimm's theory of the "irresistible impulse." "The main stream of the Aryan nations," he says, "has always flowed towards the north-west. No historian can tell us by what impulse those adventurous nomads were driven on through Asia towards the isles and shores of Europe. . . . But whatever it was, the impulse was as irresistible as the spell which in our own times sends the Celtic tribes towards the prairies, or the regions of gold across the Atlantic. It requires a strong will, or a great amount of inertness, to be able to withstand such national or rather ethnical movements. Few will stay behind when all are going. But to let one's friends depart and then to set out ourselves—to take a road which, lead where it may, can never lead us to join those again who speak our language and worship our gods—is a course which only men of strong individuality and great self-dependence are capable of pursuing. It was the course adopted by the southern branch of the Aryan family—the Brahmanic Aryans of India and the Zoroastrians of Irân."

On this passage Professor Whitney somewhat maliciously observes that a less poetic and more exact scientific statement would have been preferable, and that the paragraph seems to have been suggested by Kaulbach's famous picture "representing the scattering of the human race from the foot of the ruined Tower of Babel, where we see each separate nationality, with the impress of its after character and fortunes already stamped on every limb and feature, taking up its line of march towards the quarter of the earth which it is destined to occupy."†

Pictet, in his *Origines Indo-Européenes*, of which the first volume was published in 1859, constructed an elaborate theory of the successive Aryan migrations from Central Asia. He brought the Hellenes and Italians by a route south of the Caspian through Asia Minor to Greece and Italy, and the Celts south of the Caspian through the Caucasus to the north of the Black Sea, and then up the Danube to the extreme west of Europe ; the Slaves and Teutons marching north of the Caspian through the Russian steppes. Pictet's arguments,

* Grimm, *Deutsche Sprache*, pp. 6, 162.

† Whitney, *Oriental and Linguistic Studies*, p. 95.

derived mainly from philological considerations as to the animals and plants with which he supposed the various races to have been acquainted, vanish on examination.

In the same year Pictet's view was indorsed by a far greater name—that of one of the most acute and profound scholars of the century. So rapidly has science progressed that it seems difficult to believe that so recently as 1862 Schleicher could have propounded, in its crudest form, the theory of the successive migrations of the Aryan races from the East. "The home of the original Indo-Germanic race," he writes in his *Compendium*, "is to be sought in the central highlands of Asia." "The Slavo-Teutonic races first began their journeyings towards the west; then followed the Græco-Italo Celtic peoples; of the Aryans who remained behind, the Indians traveled south-eastward, and the Iranians spread in a south-westerly direction."

The general acceptance in this country of the Central Asian hypothesis is undoubtedly due to the confidence with which, in words already quoted,* it was propounded by Professor Max Müller in his deservedly popular *Lectures on the Science of Language*, delivered in 1861. Stamped with the hall-mark of the approval of the most eminent scholars in Europe—Pott, Lassen, Grimm, Schleicher, and Max Müller—the theory rapidly made its way into all the text-books as an accepted conclusion of linguistic science. Thus Professor Sayce writes in 1874—"When the Aryan languages first make their appearance it is in the highlands of Middle Asia, between the sources of the Oxus and Jaxartes."† It would be tedious to enumerate all the books in which this theory was accepted. Suffice it to say that it was approved by Link, Justi, Misteli, and Kiepert on the Continent, and by Sayce, Muir, Richard Morris, and Papillon in this country.

Before giving an account of the singular revulsion of opinion which has recently taken place, it may be well to examine briefly the arguments which induced the most eminent European scholars, with hardly a dissentient voice, to approve a theory which is now almost as universally rejected.

In 1880, when two daring sceptics, Benfey and Geiger, had already ventured to state the difficulties in the way of the accepted hypothesis, Professor Sayce summed up more forcibly than had been done by any previous writer the reasons why he thought it "best to abide by the current opinion which places the primeval Aryan community in Bactriana, on the western slopes of the Belurtag and the Mustag, and near the sources of the Oxus and Jaxartes."‡

He argues that "Comparative Philology itself supplies us with a proof of the Asiatic cradle of the Aryan tongue." This "proof" consists in the allegation that "of all the Aryan dialects Sanskrit and

* See p. 2, *supra*. † Sayce, *Principles of Philology*, p. 101.

‡ Sayce, *Science of Languages*, vol. ii. p. 123.

Zend may, on the whole, be considered to have changed the least; while, on the other hand, Keltic in the extreme west has changed most." Hence it would appear that the region now occupied by Sanskrit and Zend must be the nearest to the primitive centre of dispersion. This conclusion, he adds, is confirmed by the assertion in the Avesta that the first creation of mankind by Ahuramazda (Ormuzd) took place in the Bactrian region. Professor Sayce admits that "this legend is at most a late tradition, and applies only to the Zoroastrian Persians," but he thinks it agrees with the conclusions of Comparative Philology, which teach us that the early Aryan home was a cold region, "since the only two trees whose names agree in Eastern and Western Aryan are the birch and the pine, while winter was familiar with its snow and ice." He locates it in the neighborhood of the Sea of Aral, to which the universal Aryan myth of the wanderings of Odysseus may refer.

It is fortunate that we should have from such a competent authority a summary of the arguments which, after sixty years of discussion, were considered, only nine years ago, sufficient to establish the Asiatic origin of the Aryan languages.

According to Professor Sayce, the first and most conclusive "proof" is the assumption that Sanskrit and Zend are the most archaic of the Aryan languages, and that therefore the cradle of the Indo-Iranians must also be the cradle of the Aryans.

It is now recognized that the archaic character of Sanskrit and Zend is mainly due to the fact that our knowledge of these languages is derived from documents more ancient than those belonging to any of the languages with which they are to be compared. But if we confine our attention to contemporary forms of speech, and compare, for instance, modern Lithuanian with any of the vernacular dialects of India which have descended from Sanskrit, we find that the Lithuanian is immeasurably the more archaic in its character. It may be surmised that if we possessed a Lithuanian literature of a date contemporary with the oldest literature of India, it might be contended with greater reason than the cradle of the Aryan languages must have been in the Lithuanian region. In like manner it is not fair to compare ancient Zend with modern German. But if a comparison is made between modern Persian and the vernacular Icelandic, the latter is seen to have preserved the more archaic forms, so that if the argument from archaism be admissible, and the argument is confined to these contemporary languages, it would be more reasonable to place the Aryan cradle in Iceland than in Bactria.

But, it will be said, we know Iceland has been colonized within the historic period. True; but we know also that the Indo-Iranians were nomad herdsmen at a time when the European Aryans were no longer nomads, and therefore they might easily have wandered with their

herds to Bactria ; while the archaic character of the Indo-Iranian speech is explained by the parallel case of the Tartar tribes, which exhibit the conservative influence on language of a wandering pastoral life.

Against the traditions of the Avesta, which are so late as to be valueless, may be placed certain synchronous traditions of the European Aryans that they were themselves autochthonous. The Deucalion legends of the Greeks has as much, or as little value, as the traditions of the Avesta.

The philological deductions as to latitude and climate apply with as much force to Europe as to Asia ; and if the birch and the pine were known to the primitive Aryans, so also, it may be urged, was the beech, which, unlike the birch and the pine, is confined to Europe, while the ass and the camel, which were certainly unknown to the undivided Aryans, are especially characteristic of the fauna of Central Asia. As for the Sea of Aral, and the wanderings of Odysseus, they are disposed of by the fact that the words both for sea and salt are not common to the European and Asiatic Aryans, while if a sea is required, the Baltic, for that matter, would serve as well as the Sea of Aral.

It is very instructive to learn how extremely shadowy are the arguments which sufficed to convince all the greatest scholars in Germany and England, Pott, Lassen, Grimm, Schleicher, Mommsen, and Max Müller, that the origin of the Aryans must be sought in Asia, whence, in successive migrating hordes, they wandered to the West. In spite of the intrinsic probabilities of the case, in spite of the enormous difficulties of any such migration, this opinion was universally accepted, on no solid grounds whatever ; at first merely from the general impression that Asia was necessarily the cradle of the human race, and afterwards on the authority of a late Iranian legend, aided by the belief, which now proves to be baseless, of the more archaic character of Zend and Sanskrit. There is no more curious chapter in the whole history of scientific delusion. The history of the general abandonment, within the last ten years, of conclusions which had prevailed for half a century, as the first fruits of the new science of Comparative Philology, must now be sketched.

First among the causes which have led to this change of opinion must be placed the evidence as to the antiquity and early history of man supplied by the new sciences of Geology, Anthropology, Craniology, and Prehistoric Archæology. The assumption that man was a comparatively recent denizen of the earth, the traditional belief that Asia was the cradle of the human race, and the identification of the Aryans with the descendants of Japhet, had to be reconsidered when it was recognized that man had been an inhabitant of Western Europe at a time anterior to the oldest traditions, probably before the close of the last glacial epoch.

The geographical centre of human history has now been shifted from the East to the West. The earliest existing documents for the history of mankind come not from Asia, but from Western Europe. The most ancient records of any actual events which we possess are no longer the slabs with cuneiform writing disinterred from Babylonian mounds, but the immeasurably older memorials of successful hunts, preserved in the caverns of the Dordogne, which were inscribed by the contemporaries of the mammoth on the bones and tusks of extinct animals, compared with which the records on Babylonian tablets, or in Egyptian tombs, much more the traditions preserved in the Avesta, are altogether modern. The Iranian traditions may take us back for three, or, happily, for four thousand years, the Babylonian and Egyptian records for four or six thousand at the outside. The new science of Comparative Philology has made possible another science, the science of Linguistic Archaeology, which takes us back to a period older than all written records, to an age before the invention of writing or the discovery of metals, when the first rude plough was a crooked bough, and the first ship a hollow log propelled by poles.

From another new science, that of Craniology, we learn that those who now speak the Aryan languages do not belong to one race, but to several, and that the same races which now inhabit Europe have inhabited it continuously since the beginning of the neolithic period, when the wild horse and reindeer roamed over Europe.

The sciences of Prehistoric Archaeology and Geology have extended still further the history of the human race, and have shown that in Western Europe man was the contemporary of the mammoth, the woolly rhinoceros, and other extinct pachyderms, and have brought to light from the gravels of Abbeville evidences of his handiwork, dating from a period when the Somme flowed three hundred feet above its present level, and England was still united to the Continent. Man must have inhabited France and Britain at the close of the quaternary period, and must have followed the retreating ice of the last glacial epoch, to the close of which Dr. Croll and Professor Geikie assign on astronomical grounds an antiquity of some 80,000 years.

When it was recognized that Europe had been continuously inhabited from such remote ages, it was at once asked whether there is any evidence at all for those great successive migrations from Central Asia which have been so confidently assumed. Is there any reason for supposing that the present inhabitants of Europe are not in the main the descendants of the neolithic races whose rude implements fill our museums? If not, what became of these primitive people? And when the anthropologists succeeded in proving that the skulls of the present inhabitants of Central France are of the same peculiar type as the skulls of the cave-men and dolmen builders who inhabited

the same region at the beginning of the neolithic period, when they proved that the skulls of the Spanish Basques belonged to another neolithic type, when they proved that the neolithic skulls from Sweden belong to a third type which is that of the Scandinavians and Northern Teutons, when similar discoveries were made in Denmark, in England, and in Eastern Europe, the conclusion seemed inevitable that the present inhabitants of Spain, France, Denmark, Germany, and Britain are to a great extent the descendants of those rude savages who occupied the same regions in neolithic or possibly in palæolithic times.

It is the anthropologists who have been the chief apostles of the new doctrine, but it must be acknowledged that the first protest against the old assumption of the philologists was raised, before anthropology became a science, by a man who was himself a philologist. To the late Dr. Latham belongs the credit of having been the first to call in question the prevalent belief. As early as 1851, in his edition of the *Germania* of Tacitus, he ventured to assert that no valid argument whatever had been produced in favor of the Asiatic origin of the Aryans. He maintained, on the other hand, that a European origin was far more probable. His argument was two-fold. He urged, firstly, that Lithuanian is closely related to Sanskrit, and no less archaic. Sanskrit must either have reached India from Europe, or else Celtic, German, Lithuanian, Slavonic, Greek, and Latin must have reached Europe from Asia. He says he finds no argument whatever in favor of the latter hypothesis, but merely a "tacit assumption" that the human species, and the greater part of our civilization, originated in the East. But if this tacit assumption be rejected, what, he asked, is the most probable conclusion? We find the main body of the Aryans in Europe, and a small detached body in Asia. Which, he argued—and his argument has never been answered—is *à priori* the more probable, that the smaller body broke away from the larger, or the larger from the smaller? The species comes from the genus, and not the genus from the species. To derive the Aryans of Europe from those of Asia would be as reasonable as to bring the Germans from England, instead of bringing the English from Germany; or to derive the reptiles of England from those of Ireland. We find, he argues, two bodies of Aryans, one nearly homogeneous, and of small geographical extent, the other spread over a vast region, and exhibiting numerous varieties. It is more reasonable to suppose that the small homogeneous body branched off from the larger than to assume that the larger parted from the smaller. If we found in Australia a single family of Campbells, and in Scotland a whole clan, it is antecedently more probable that the Australian family emigrated from Scotland than that the Scotch clan came from Australia, leaving only one family behind them.

Latham's argument, extended as it has been by subsequent researches, may be represented graphically by the diagram on this page.

Linguistically the Slaves are closely related to the Letts, and the Letts to the Teutons, as has been shown by Bopp, Zeuss, Schleicher, Fick, and Schmidt. The Teutons, again, have been connected with the Celts by Ebel, Lottner, and Rhys; while the relation between the Celts and Latins has been shown by Newman, Schleicher, and Lottner. Again, Mommsen, Curtius, Förstemann, Fick, Schleicher, and Schmidt have shown the connection between Latin and Greek; while the connection between Greek and Indo-Iranian has been established by Grassman, Benfey, Sonne, and Kern. Again, Schmidt, Ascoli, Leskien, and Miklosich have proved the connection between Indo-Iranian and Slavonic. Lastly, Schmidt has shown the absence of cross connections, such as between Greek and Slavonic, or between Indo-Iranian and either Latin or Teutonic.

Hence the European Aryans form a closely-united circular chain of six links; but there is one vacant place—one link is missing from the chain. This missing link is discovered far away in Asia, where we find the Indo-Iranians, who are very closely united with each other,

but whose affinities with the European Aryans are chiefly with the Slaves on the one hand, and with the Greeks on the other. They clearly constitute the missing link in the chain, which would be complete in its continuity if they had at some former period occupied the vacant post.

Only two hypotheses are possible. The Aryan languages must either have all originated in Europe around the spot marked E; one member, the Indo-Iranian, separating from the rest, and migrating to its present position, or they must all have originated in Asia, and have been grouped originally around the spot marked A, and then have migrated severally to E, preserving in their new homes the precise relative positions which their mutual connections prove must have originally existed. Which is the more probable hypothesis—that of a single migration, the migration of a people whom we know to have been nomads at no very distant time, or six distinct migrations of six separate peoples, as to which there is no evidence whatever that they ever migrated at all, and whose traditions assert that they were autochthons?

Latham's argument was more conclusive than any that had been advanced on the other side, but it was unheeded. The assumption as to the Asiatic origin of the European peoples was so firmly rooted, and, more than all, was upheld by the authority of such great names, that no one thought it worth while to take the trouble even to reply. His voice was a *vox clamantis in eremo*. He was met, not with argument, but with mockery ; and more than twenty years after his book had appeared a learned German thus characterized the fruitful suggestion which has revolutionized the science of Ethnology : "And so it came to pass that in England, the native land of fads, there chanced to enter into the head of an eccentric individual the notion of placing the cradle of the Aryan race in Europe."*

After Latham's views had lain unheeded before the world for sixteen years they received the qualified support of Professor Whitney, who ventured to call in question the Central Asian theory, denying that the traditions in the Avesta had any bearing on the direction of the earliest Aryan migrations, and maintaining that neither language, history, nor tradition had as yet thrown any light on the cradle of the Aryan race.

This was a useful protest, as scholars had not then realized the fact, now generally admitted, that the differentiation of the Aryan languages must have taken place at a period immeasurably more remote than could possibly be reached by the oldest Aryan traditions.

Whitney's position, however, was merely that of an agnostic ; he saw that the arguments produced in favor of an Asiatic origin were valueless, but he did not perceive that arguments not without force might be adduced in favor of another solution.

It was only in 1868, after seventeen years of contemptuous neglect, that Latham found his first real disciple—a disciple who did not confine himself to the merely skeptical standpoint of Whitney, and a disciple, moreover, of such eminence that his opinions could not be treated with contempt as merely an amusing illustration of the customary eccentricity of the English. In 1868 appeared the first edition of Fick's *Vergleichendes Wörterbuch der Indogermanischen Sprachen*, accompanied by a preface by Benfey, containing the germ of an argument which has subsequently been greatly developed by other scholars. In this memorable preface Benfey may be said to have originated the science of Linguistic Palæontology. He suggested that the investigation of the vocabulary common to the whole of the Aryan languages might yield a clue to the region inhabited by the Aryans before the linguistic separation. He contended that certain animals, such as the bear and the wolf, and certain trees, such as the beech

* " Da geschah es (Hehn wrote in 1874), dass in England, dem Lande der Sonderbarkeiten, ein originelles Kopf es sich einfallen liess, den Ursitz der Indo-germanen nach Europa zu verlegen."

and the birch, with which the primitive Aryans must have been acquainted, are all indigenous to the temperate zone, and, above all, to Europe, whereas the characteristic animals and trees of Southern Asia, such as the lion, the tiger, and the palm, were known only to the Indians and the Iranians. He urged that the absence from the primitive Aryan vocabulary of common names for the two great Asiatic beasts of prey, the lion and the tiger, or for the chief Asiatic beast of transport, the camel, is difficult to explain on the theory of the migration of the Aryans from the region eastward of the Caspian. That the Greeks called the lion by its Semitic name, and the Indians by a name which cannot be referred to any Aryan root, argues that the lion was unknown in the common home of Greeks and Indians.

Some of these conclusions have been contested, but Benfey's merit was, not only that he indicated a fresh region for research, but that he pointed out the battlefield on which the whole question has since been fought. The great archæological discoveries which took place between 1860 and 1865, especially those of the flint implements in the gravels of the Somme, the Danish shell mounds, the Swiss Lake Dwellings, and the caves in Aquitaine, together with the publication of such works as Lubbock's *Prehistoric Times* in 1865, and of Lyell's *Antiquity of Man* in 1873, could not fail to modify the ethnological assumptions which had been hitherto unquestioned.

Benfey saw clearly that the conclusions of the philologists, by whom alone the question had hitherto been discussed, would have to be revised in accordance with the teachings of the new sciences of geology, archæology, and anthropology. "Since," he says, "the investigations of the geologists have established the fact that from immemorial times Europe has been the abode of man, the whole of the arguments which have been adduced in favor of the migration of the Aryans from Asia fall to the ground." Written, be it remembered, in 1868, this was indeed a prophetic utterance. The revolution in opinion has been brought about by the anthropologists, the philologists merely following tardily in their train.

Benfey's declaration speedily bore fruit, and Geiger forthwith ranged himself in the same camp,* but placing the cradle of the Aryans, not as Benfey had done, in the region to the north of the Black Sea, but more to the north-west, in Central and Western Germany. Geiger's contribution to the argument was not without its value. He bases his conclusions largely on the tree names which belong to the primitive Aryan vocabulary. In addition to the fir, the willow, the ash, the alder, and the hazel, he thinks the names of the birch, the beech, and the oak are specially decisive. Since the Greek $\phi\gamma\tau\circ\delta$, which denotes the oak, is the linguistic equivalent of the Teutonic *beech* and of the Latin *fagus*, he draws the conclusion that the

* Geiger, *Zur Entwicklungsgeschichte der Menschheit*, pp. 113-150. (Stuttgart, 1871.)

Greeks migrated from a land of beeches to a land of oaks, transferring the name which denoted the tree with "eatable" fruit from the one tree to the other. This argument is as valuable as it is ingenious. The characteristic forest tree of Greece is the evergreen oak, the beech not being found south of Dodona, in the centre of Epirus. The oldest Greek legends are connected with Dodona, where the earliest prophetic utterances were obtained from the rustling of the leaves of this sacred tree. Hence we may believe that the Hellenes entered the peninsula from the north-west through the valleys of Epirus, a route which will explain how the old Aryan word, which originally meant the beech, was transferred to designate the tree which flourished on the hill-slopes of the territory into which they moved.*

The objection that the Greeks must have had a name for the oak before they entered Greece is met by the fact that the word which means "tree" in Sanskrit and Teutonic is used to denote the oak in

* This explanation of the transference of the name seems more probable than the well-known suggestion of Professor Max Müller, that the word originally denoted the oak, and was transferred to the beech at the time when the oak forests of Jutland were replaced by beeches. This would not account for the word *fagus* meaning "beech" in Latin, for the Umbrians had already reached Italy before the age of bronze, while in the bronze age of Denmark, which was later than the bronze age in Italy, the oak was still the prevailing tree, the beech only appearing sporadically. Moreover the replacement of the oak by the beech in Jutland occupied a long period. Had the people of Denmark no name for the beech when it first appeared, and what did they call the oak during the many centuries while it was being gradually replaced by the beech? On the other hand, a people migrating as the Greeks did, from a land of beeches to a land of oaks, would readily transfer the name of the one tree to the other, as in the case of the United States, where the English names of the robin, the maple and the hemlock have been applied to denote wholly different species. The question as to whether the word originally meant the oak or the beech is not unimportant, as, if it denoted the beech, it is difficult to avoid the conclusion that the cradle of the Aryans was west of the beech line. The beech, which is a lover of chalk soils, is not only absent from Hellas proper, but is not found east of a line drawn from the south of Norway to the Swedish coast near Gottenburg, and then from Königsberg through Poland and Podolia across the Russian steppes to the Crimea, and terminating in the Caucasus. Now the name of the beech, transferred by the Greeks to the oak, is common to the languages of the European Aryans, but is absent from the Indo-Iranian languages. Either they lost the name, because, like the Greeks, they had lost the tree, or else their portion of the common home lay east of the beech line. But if, on the other hand, the cradle of the European Aryans, more especially of the Teutonic and Italic families, had been in Central Asia, where the beech is unknown, it is extremely difficult to explain how the ancestors of the Latins, Celts, and Teutons, migrating, as Pictet contends, at separate times, and by different routes, to lands where the beech abounds should have called it by the same primitive name, but modified according to the phonetic laws of Latin and German, the German *b* corresponding to the Latin *f*, and the German *k* to the Latin *g*. The Slavonic name for the beech is a loan word from the German, a fact which indicates that the primitive seat of the Slaves was east of the beech line, just as that of the Latins, Greeks, and Germans must have been to the west of it.

Greek and Celtic. Hence it was only the evergreen oak or ilex to which the name of the beech was transferred. Geiger also maintained that the undivided Aryans must have lived in a cold northern region, since the name of the birch is common to all the Aryan languages, and he contended that the cereals originally known were barley and rye, but not wheat. The word "rye" is common to the Teutonic, Lettic and Slavonic languages, and has been identified by Grimm with the Sanskrit *vrīhi*, rice. But that the primitive meaning was "rye," and not "rice," appears from the agreement of the North European languages with each other, and with the Thracian *βρίτσα*. The zone which comprised barley and rye, but not wheat, must be sought somewhere to the north of the Alps, the limit of wheat having doubtless been extended northward since primitive times.

Geiger also argued that the undivided Aryans were acquainted with woad and its use, that they were familiar with snow and ice, and had common words for winter and spring, but none for summer and autumn—facts which all point to a northern habitat. He maintains that no proof has ever been adduced of any Aryan migration from the East to the West, and that on all these grounds the cradle of the Aryans is more probably to be sought in Europe than in Asia. He concludes by saying, "Of the two opposed theories (a European or an Asiatic origin) one only is supported by any reasons; for the migration from the East not a single argument has been adduced. It is improbable in itself, and well-nigh impossible, if we are to suppose it took place by successive waves." To suppose that a small Aryan tribe first migrated to Europe, and that the various Aryan languages were subsequently developed, is practically equivalent to a European origin.

To Geiger's argument it was replied by Piètremont that there are regions in Asia whose Fauna and Flora conform to the linguistic conditions. Such a region, he thought, might be found in the neighborhood of Lake Balkash and the Alatau. But it was rejoined that this region has always, so far as we know, been the home of Mongolic races, and that the hypothesis of an early Aryan population was purely gratuitous and supported by no evidence, no vestiges of any Aryan population having been discovered in this region, which is too barren and inhospitable to have been the cradle of such a numerous race.

In the same year that Geiger's book was published a noteworthy contribution to the discussion was made by Cuno,* who contended that the undivided Aryans, instead of being a "small clan," must have been a numerous nomad pastoral people inhabiting an extensive territory. A long period—several thousand years—he considered, must have been occupied in the evolution of the elaborate grammatical system of the primitive speech, while the dialectic varieties out of which the Aryan languages were ultimately evolved could not have arisen

* Cuno, *Forschungen im Gebiete der alten Völkerkunde*. (Berlin, 1871.)

except through geographical severance. The necessary geographical conditions were, he thought, a vast plain, undivided by lofty mountain barriers, by desert tracts, or impassable forests, together with a temperate climate, tolerably uniform in character, where a numerous people could have expanded, and then, in different portions of the territory, could have evolved those dialectic differences which afterwards developed in the several Aryan languages.

There is only one region, he contends, on the whole surface of the globe which presents the necessary conditions of uniformity of climate and geographical extension. This is the great plain of Northern Europe, stretching from the Ural Mountains over Northern Germany and the north of France as far as the Atlantic. In this region, he thinks, and no other, the conditions of life are not too easy, or the struggle for existence too hard, to make possible the development of a great energetic race such as the Aryans. At the beginning of the historic period we find this region occupied by the Celtic, Teutonic, Lithuanic, and Slavonic races, whom he regards as autochthonous. At some earlier time he considers that the Italic and Hellenic races had extended themselves to the South across the mountain chain of Central Europe, and the Indo-Iranians had wandered with their herds further to the East, subduing and incorporating non-Aryan tribes.

To this it might be replied that the steppes of Central Asia, extending eastward of the Caspian for more than a thousand miles beyond Lake Balkash, also offer the necessary conditions, and that here the great Turko-Tartaric race has grown up, presenting an actual picture of what the Aryan race must have been in the early nomad stage of its existence. But it must be conceded to Cuno that the conditions of climate, of soil, of greater geographical extension, and of proximity to the regions now occupied by the Aryans, are arguments for selecting the European rather than the Asiatic plain as the probable cradle of the Aryan race.

It will hereafter be shown that Craniology, Archæology, and Linguistic Palæontology, sciences with which Cuno had a very limited acquaintance, have supplied remarkable confirmations of his hypothesis.

Cuno was not only the first to propound what must be regarded as the most probable solution of the problem, but he was also the first to insist on what is now looked on as an axiom in ethnology—that race is not co-extensive with language. The existing extension of Aryan speech is, he contends, largely the result of conquest and of the incorporation of unwarlike tribes by the more energetic northern races. By reason of their language, he says, we now class the Spaniards among the Latin races, and yet how small is the trace of Roman blood in Spain. It is the same in France, Belgium, and Roumania. In these regions neo-Latin languages prevail, but there is very little

Latin blood, in some cases practically none. How much common blood, he asks, is there in the veins of Teutons and Hindus, or of Celts and Persians, or of Russians and Spaniards, and yet all these nations speak closely-related languages, which we call Aryan.

The southern and eastern extensions of Aryan speech may therefore be due to Aryan conquest, or to the gradual expansion of Aryan civilization over contiguous tribes, and there is therefore no difficulty in regarding the great plain of Northern Europe as the region in which the Aryan race originated.

Cuno then goes on to note that a large portion of North-Eastern Europe is now, or has been in historical times, occupied by Finns. Between Finnic and Aryan speech the relations are intimate and fundamental. They show themselves not so much in vocabulary as in the pronouns, the numerals, the pronominal suffixes of the verb, and the inner morphological structure of language. The extreme members of the Ural-Altaic family, such as the Finns and the Mongols, are separated by differences almost as wide as those which divide Finnic from Aryan speech.

The conclusion he draws is not, however, the obvious conclusion that the Finnic tongues may represent a form of speech out of which the Aryan languages might have been evolved, but that the Finns and Aryans must have been originally in contact, so that if we bring the Aryans from Central Asia we must also find room for the Finns in the same region.

What Cuno failed to notice, though it lay ready to his hand, is the probability that the dialectic differences in Aryan speech may be largely due, not, as he thought, merely to geographical separation, but to the imperfect acquirement of a strange language by those non-Aryan tribes which were Aryanized by conquest. This pregnant suggestion is due, as we shall presently see, to another writer.

Cuno's most important contribution to the controversy was his demolition of the assumption that Aryan blood must be co-extensive with Aryan speech. Another gratuitous assumption, the whole theory of the successive migrations of Aryan tribes from the East, was swept away in the following year by Johannes Schmidt in a pamphlet of sixty-eight pages.* A pebble from the sling of a shepherd boy smote down the Philistine giant, and in like manner this little essay, by a young and almost unknown writer, made an end of the huge structure which had been painfully reared by some of the giants of philology. If, as had been hitherto supposed, the ancestors of the Aryan nations—Celts, Teutons, Lithuanians, Slaves, Latins, and Greeks—had, one after the other, left the parent hive, and had marched in successive or associated swarms from Central Asia to find new homes in Europe,

* Schmidt, *Die Verwantschaftsverhältnisse der Indogermanischen Sprachen.* (Weimar, 1872.)

it would manifestly be possible to construct a pedigree in the form of a genealogical tree, representing graphically the relationships and affiliations of the Aryan languages, and their connection, more or less remote, with the parent speech. For twenty years philologists had occupied themselves in the construction of such trees, but no two of their schemes agreed. Bopp, Pott, Grimm, Lottner, Schleicher, Pictet, Zeuss, Fick, Förstemann, Grassmann, Sonne, Curtius, Max Müller, Pauli, Spiegel, Justi, Ebel, were hopelessly at variance as to the ramifications of the supposed Aryan tree, a matter which, if an Aryan family had really existed, ought to have been susceptible of exact determination. There was a fundamental difference of opinion as to whether Slavonic was to be classed with the European or the Asiatic languages, whether it was a sister tongue of German or of Zend, and there was a similar dispute as to the relationship of Greek, some scholars considering it to be most closely allied to Latin; and others maintaining that the relationship was with Sanskrit, while opinions were divided as to whether the separation of the Celts was very early or very late, and whether their nearest affinities were with Latin or Teutonic. There was also a fundamental difference of opinion as to whether the earliest cleavage was between the Northern and the Southern languages, or between the Eastern and the Western, and also, as has been said, as to whether Greek and Slavonic must be classed among the Eastern or the Western tongues.

This *stammbaum* controversy, as it was called, which seemed to be interminable, received a solution as complete as it was unexpected. Schmidt's pamphlet placed the whole matter on a new footing. The disputants were shown that none of their apparently irreconcilable opinions as to the affinities of the Aryan languages were necessarily wrong, but that the method of representing those affinities by a genealogical tree must be given up. Schmidt asserted that the relationship could not be represented by the branches of a tree, but were analogous to the waves caused by disturbances in a pond. He supposes that at some early period the geographical continuity of the primitive Aryan speech was unbroken. At certain points in this area local centres of disturbance arose, and new linguistic formations, or new phonetic variations, began to manifest themselves, and then spread, like waves, in every direction from the point where they originated, the disturbances growing feebler the further they extended, in the same way that concentric wave-circles arise when stones are dropped into still water at parts more or less remote. These waves would spread in concentric circles round the centres of disturbance, till at length they interfere. In this way, he thought, the difficulties could be explained, and the opposite contentions at last be reconciled.

The two chief points which had been disputed between the parti-

sans of rival "trees" were, as we have seen, whether Slavonic was a branch from the Iranian or the Teutonic stem, and whether Greek had bifurcated from Latin or from Sanskrit. Schmidt showed that Greek was in some respects as closely united with Sanskrit as it was in others with Latin, while Slavonic shared certain peculiarities only with Teutonic, and others only with Iranian. Schmidt also showed that the more geographically remote were any two of the Aryan languages, the fewer were the peculiarities they possessed in common. Thus, while there are fifty-nine words and roots peculiar to Slavo-Lithuanian and Teutonic, and sixty-one to Slavo-Lithuanian and Indo-Iranian, only thirteen are peculiar to Indo-Iranian and Teutonic. Again, while one hundred and thirty-two words and roots are peculiar to Latin and Greek, and ninety-nine to Greek and Indo-Iranian, only twenty are peculiar to Indo-Iranian and Latin. Hence Slavonic forms the transition between Teutonic and Iranian, and Greek the transition between Latin and Sanskrit. Schmidt successfully contended that the notion of a genealogical tree must be entirely given up. There must at one time, he thought, have been an inclined plane of language, sloping continuously over the whole domain of Aryan speech from East to West—from Sanskrit to Celtic. At various points dialectic differences arose, and then, owing to political, social, or religious causes, certain local dialects obtained predominance and developed into languages, exterminating the weaker intermediate dialects. In like manner Attic exterminated the other Greek dialects, and the dialect of Rome absorbed Oscan, Umbrian, and the other Italic dialects. Thus, he thought, the inclined plane of Aryan speech was broken up into steps and converted into a staircase.

Schmidt's theory of the origin of the Aryan languages resembled Darwin's theory of the origin of species. Languages were due to some unknown tendency to variation, coupled with the extermination of intermediate varieties, and the survival of the prepotent. This principle has recently been ably developed by Professor Paul in his *Principien der Sprachgeschichte*.

Schmidt's argument was plainly fatal to the old theory of successive separations and migrations from the East. It was manifest that the linguistic differences must have arisen *in situ* at a time when the Aryan nations occupied much the same relative geographical positions as they do now.

Leskien improved on Schmidt's theory by introducing the element of relative time. It was not necessary, he maintained, to suppose that all the disturbances were simultaneous. One disturbance, for instance, might have affected the Teutonic region and spread to the contiguous Slaves, and then, after the Slaves and Teutons had become separated, another disturbance might have affected the Slaves and spread to the Iranians. Penka afterwards suggested a *vera causa* for

these disturbances, which Schmidt had considered to be arbitrary or accidental.

Combining Cuno's theory with Schmidt's, he argued that as the primitive Aryans must have incorporated many non-Aryan races, the dialectic differences may be due to these incorporations. For instance, the peculiarity shared by Lithuanians and Slaves may be due to the incorporation of Finnic tribes, and those common to Slaves and Iranians to the incorporation of Ugrians. That there may be some truth in this explanation is shown by the fortunes of the neo-Latin languages. It is highly probable, for instance, that some of the differences which distinguish French and Spanish may be due to the fact that in one case Latin was a foreign language acquired by Celts, and in the other by Iberians.

The loss of inflections in French and Persian was largely due to the difficulty felt by Frankish and Arab conquerors in acquiring a foreign tongue. English has been similarly affected—first by the coalescence of Saxon and Anglian speech, and then by the influence of the Danish and Norman conquests and the preaching of the Franciscan monks. In the process it has lost its genders and four of its five cases, while of the six ways of forming the plural all were lost but one. In like manner, when we find that Latin lost three of the old tenses, and formed a new future, a new perfect, a new imperfect, and a new passive, we have to take into account the possibility of the incorporation by Aryan invaders of a non-Aryan population.

But the influence of these theories was more far-reaching than their advocates had supposed. The ultimate result has been to bring about a conviction not only that there is no such thing as any pure Aryan race, but that the existence of a primitive Aryan language is doubtful.

In 1880 Delbrück,* after discussing the *stammbaum* theory, and the theories of Schmidt and Leskien, came to the conclusion that there had never been, as had been universally assumed, any uniform primitive Aryan speech. The development of the inflections must have occupied, he thinks, many thousand years, and the Aryans, before the grammar was fully developed, must have become a very numerous people, occupying an extended territory, within which vast region diversities of speech must have originated. These diversities were the germs of some of the differences which now separate the families of Aryan speech. In short, the primitive Aryan speech had begun to break up into dialects before it was fully formed.

The publication in 1871 of the books of Geiger and Cuno marked the beginning of a new era in the controversy. Up to this time the Asiatic origin of the Aryans had been the orthodox view which it was a scientific heresy to doubt. The Asiatic or the European origin now

* Delbrück, *Einleitung in das Sprachstudium*, pp. 131-137.

became an open question, and the ensuing decade was a period of unceasing strife between the partisans of the rival theories. Year by year the adherents of the old hypothesis became fewer and less confident, while the European theory found fresh advocates among the younger generation of scholars.

Höfer repeated the old argument, that since the most archaic forms of Aryan speech are preserved in the Rig Veda and the Avesta, the cradle of the Aryans must have been in the region where Sanskrit and Zend were spoken—an argument already answered by Whitney with the remark that among existing languages Icelandic and Lithuanian preserve the primitive forms of Aryan speech more faithfully than the Armenian or the Kurd.

Piètrement revived once more the argument from the geographical traditions of the Avesta, which may be valid for the later migration of the Iranians, but not for those of any other race, or even for the earlier migrations of the Iranians.

Kiepert and Hehn followed with the contention that Asia is the true *officina gentium*, and that the analogy of other migrations from East to West makes it difficult to believe that the earliest and greatest of all took place in the opposite direction. Is it credible, says Hehn, that the oldest forms of Aryan speech are to be sought in the woods and swamps of Germany rather than in the literary monuments of

• India and Bactria?

To this it might be replied—if indeed mere rhetoric requires a reply—that if Ghengiz Khan marched from Bactria to Europe, Alexander marched from Europe to Bactria; and that if Tamerlane led his army westward to Galatia, the Galatians themselves had marched eastwards from Gaul to Galatia; while, if Germans and Slaves at one time extended their border to the West, they have now for several centuries been extending it to the East.

The logical weakness of the Asiatic hypothesis cannot be better shown than by the fact that a zealous and able advocate like Hehn was driven to resort to such feeble analogies in lieu of solid argument.

Perhaps the strongest argument that has been adduced in favor of the Asiatic origin of Aryans is that which has been drawn by Hommel, Delitzsch, and Kremer, from certain supposed primitive relations between Aryan and Semitic speech. That the Semites originated in Asia may be admitted, and if any fundamental connection could be shown between the Aryan and Semitic languages there would be reason to suppose that the cradles of the two races must be sought in contiguous regions. Hommel adduces six culture words which, he thinks, establish such a primitive connection. But six words are not enough to base a theory on; the phonetic resemblances may be accidental, or the words may be very early loan words due to Phœnician

commerce. This is probably the case with the names of silver, gold, and wine, which, as will hereafter be shown, there is reason for believing, on archæological grounds, to have been unknown to the early Aryans.

Delitzsch goes deeper. He claims to have identified one hundred Semitic roots with Aryan roots. But even if these identifications be accepted, it would not suffice, as it would be also necessary to show an agreement of grammatical formative elements ; and it is universally admitted that in grammatical structure the Semitic and Aryan languages differ fundamentally. The agreement of certain primitive verbal roots, if they do agree, may, possibly, be otherwise explained. The speakers of Aryan languages are not all of Aryan race. It will hereafter be shown that the Mediterranean race of Southern Europe was probably Berber or Hamitic. A remote connection between the Semitic and Hamitic families is generally admitted, and there are numerous verbal roots which seem to be common to the Hamitic and Semitic languages. If the Southern Aryans are only Aryanized Hamites, it would account for fundamental differences in Semitic and Aryan grammar co-existing with certain coincidences of Semitic and Aryan roots.

In spite of these objectors, possibly because their objections were so feeble, the new doctrine continued to gain adherents. In 1873 Friedrich Müller admitted the force of the arguments for a European origin which had been adduced by Benfey and Geiger from the names of animals and plants common to the Aryan languages. About the same time Spiegel also combated the arguments drawn from the traditions in the Avesta, and urged that it was impossible to believe, with Monier Williams, that a region so lofty, so barren, and so inhospitable as the Pamir could have produced such vast swarms of men as the theory of an Aryan migration would demand, or that they could have vanished without leaving a trace behind ; and he declares his adhesion to the view that the cradle of the Aryans must be sought in Europe between the 45th and 60th parallels of latitude.

In this region, he maintains, is a land well suited for the development of the primitive Aryan race. Here we may find room for their expansion, both to the East and to the West, an expansion in which migration, properly so called, played a very insignificant part. The Aryan race, he continues, must constantly have extended itself, including within its domain other races, owing to whose absorption there arose dialectic varieties of speech, which, in course of time, aided by geographical severance and the absence of a literature, gradually developed into separate languages. No more rational theory, it may be affirmed, than this of Spiegel has yet been advanced to account for the origin of the Aryan languages.

Pösche, in a monograph devoted to the controversy,* was the first

* Pösche, *Die Arier, Ein Beitrag zur historischen Anthropologie.* (Jena, 1878.)

to bring forward the anthropological argument, which has since been developed by Penka. He maintained that anthropology and archæology must supplement and correct the conclusions of philology. He urged, as Broca had urged before, that, while there may be Aryan languages, there is no such thing as an Aryan race, and that language is only one, and that the least important factor in the inquiry, and that, while Aryan languages are spoken by races wholly unrelated, there is only one race, the tall, blue-eyed, fair-skinned German race, with abundant beard and dolichocephalic skull, which can claim to be genuine Aryans by blood as well as by language.

Pösche identified this race with that whose skeletons are found in the Alemannic "row-graves" of Southern Germany, and he contended that it has existed in Europe since the neolithic period. This argument was discredited by his theory, which has not found favor with anthropologists, that the Aryan race originated in the great Rokitno swamp, between the Pripet, the Beresina, and the Dnieper. Here depigmentation or albinism is very prevalent, and here he considers the fair white race originated. In this swamp, he thinks, lived the pile-dwellers who afterwards extended themselves to the Swiss lakes and the valley of the Po. The archaic character of the neighboring Lithuanian language induced him to believe that the Lithuanians were a surviving relic of this oldest Aryan race.

The obvious objections to this theory are that the Rokitno swamp is not sufficiently extensive for the cradle of such a numerous people, and that the Aryans, an athletic and energetic race, exceeded in vital force by no other people, could hardly have originated in an unhealthy region, where the conditions of existence are depressing, while the sickly, tow-haired albinism which prevails in the Rokitno swamp is quite different from the tawny hair and the ruddy, healthy, lily and carnation tint of his typical Aryans. Moreover, there is good reason for believing that the primitive Aryans were nomad herdsmen, an occupation unsuited to the conditions of the Rokitno swamp.

Two years later the European hypothesis received the adherence of Lindenschmit, who considers that "we must give up the idea of an Aryan migration from the East as an old delusion derived from historical traditions."* He comes to the conclusion that there is no specially oriental character in the common vocabulary of the primitive Aryans, and he agrees with Benfey in thinking that the absence of primitive Aryan designations for the elephant and the camel, the lion and the tiger, is a strong argument against an Asiatic origin. He also combated, with well-chosen instances, Hehn's argument that the direction of conquest and migration has always followed the movement of the sun from east to west.

He argues that the vital energy and the power of expansion of the

* Lindenschmit, *Handbuch der deutschen Alterthumskunde*, 1880, p. 5.

European Aryans is unique. They are long-lived and possess great muscular force, and hence the cradle of such a tall, powerful, energetic race is not likely to have been in Asia, which has not, so far as we know, developed great physical capacity. He thinks the case of the Goths, the Scandinavians, the Normans, the Scotch, the English, the Germans, and the Dutch, who have overrun the South, who have colonized America, and ruled vast territories in Asia, teaches us that it is in Northern Europe only that we find, in its highest development, the characteristics of the energetic Aryan race. Where these characteristics are now chiefly developed is probably the region where they originated.

Fligier followed in 1881 with a repetition of Cuno's argument as to the primitive connection of the Finnic and Aryan languages, from which he drew the conclusion that the true *vagina gentium* is to be sought in Eastern Europe.

A new epoch in the discussion opened in 1883 with the publication of two remarkable books, which have brought the whole question again into prominence, and have exerted a decisive influence on public opinion. The first of these was a slashing but somewhat one-sided work by Karl Penka,* somewhat feeble from the philological side, but in which the anthropological arguments advanced by Pösche were restated with considerable force. The second, by far the most important book which has yet been written on the subject, was the exhaustive treatise by Dr. Schrader,† which contains a cautious and judicial statement of the whole case.

As many of the arguments and facts adduced by these writers will be reproduced in the following chapters, it will only be necessary, in this historical summary, briefly to state the conclusions at which they have arrived.

In his *Origines Ariacæ*, and in a subsequent work‡ in which he replied to his critics, and brought forward fresh facts and arguments in support of his views, Penka maintained that Aryan blood is far from being co-extensive with Aryan speech. He proved that those who employ Aryan languages belong to several distinct anthropological types. The primitive Aryans must, however, have been of only one race. Either the physical types must have been developed subsequently to the linguistic separation, or Aryan speech must have been acquired by races not of Aryan blood. The former supposition is most improbable, knowing, as we do, the persistency of type displayed during thousands of years by the Egyptians, the Negroes, and the Jews.

* Penka. *Origines Ariacæ*. (Wien, 1883.)

† Schrader. *Sprachvergleichung und Urgeschichte*. (Jena, 1883.) From the proof-sheets of the forthcoming revised edition of this book an English translation by Mr. F. O. Jevons is announced for early publication.

‡ Penka, *Die Herkunft der Arier*. (Wien, 1886.)

The latter supposition is inherently probable, as there are numerous instances of change of language being effected without any change of race. Language, in short, is mutable, race persistent. The question therefore arises, which of the five or six types found among the speakers of Aryan languages represents most faithfully the type of the primitive Aryans? Penka contends that the purest blood is found in Scandinavia among the fair-haired, blue-eyed, dolichocephalic Swedes. The pure Aryans, he maintains, are represented only by the North Germans and Scandinavians, a most prolific race, of great stature, muscular strength, energy, and courage, whose splendid natural endowments enabled it to conquer the feebler races to the East, the South, and the West, and to impose its language on the subject peoples. That the nations of Central and Southern Europe exhibit hardly any traces of the fair northern blood is due, he believes, to the tendency of mixed races to revert to one of the original types. He contends that the northern race, which is prolific in cold climates, becomes sterile in southern latitudes, and ultimately dies out; while the fact that among the Southern Aryans the nobles are fairer and taller than the peasants is an indication of conquest by northerners.

To take an instance from historical times, we see how completely in Italy and Spain the blood of the fair-haired Gothic conquerors from the Baltic has died out, while in Sweden, Northern Germany, and the north of England, the fair type survives because the climatic conditions permit of its preservation. The influence of climate has exterminated the Aryan race in India, Persia, Greece, Italy, Spain, France, and Southern Germany, the Aryan speech alone being left as the permanent evidence of early Aryan conquest.

Penka has undoubtedly weakened his argument by the unnecessary contention that Scandinavia was the cradle of the whole Aryan race. It is difficult to believe that a sufficiently extensive area for the growth of such a numerous people can be found in the forest-clad valleys of Norway and Sweden, which moreover are unadapted for the habitation of a nomad pastoral people, such as the primitive Aryans must have been. Isolated valleys, moreover, tend to the rapid growth of dialects, unity of language being the result of the wanderings of nomad tribes over an extensive plain. In mountain regions like Switzerland and the Caucasus, the people of contiguous valleys speak different languages, while the same language extends over vast regions in the steppes of Central Asia. Penka would have done better to have adopted Cuno's argument, and to have placed the cradle of the Aryans in the great plain of Northern Europe, from which a later emigration to Scandinavia might easily have taken place. This would also have avoided the objection that the primitive Aryans could hardly have possessed the means of migrating across the Baltic in the vast swarms which the hypothesis demands. Sweden is almost as un-

suited for the cradle of the Aryans as the Rokitno swamp suggested by Pösche.

We shall, however, hereafter see that the tall, fair Scandinavians are not the only tall, fair people which may represent the ancestral Aryan stock, and that many of the difficulties—geographical, linguistic, and anthropological—which beset Penka's theory disappear at once if we assume that the Celtic race of Central Europe, rather than the Teutonic race of Scandinavia, are the lineal descendants of the primitive Aryans.

Penka also, as we have already seen, accounts for the differentiation of the Aryan languages by a development of Spiegel's theory, which he works out with much ingenuity, that each conquered race, on acquiring the language of its conquerors, would leave upon the acquired speech the impress of the language that was lost.

Of higher quality in every respect is the book of Dr. Schrader, which must long remain the standard work on the subject, as Dr. Schrader reviews, in a judicial spirit, the arguments of preceding writers, and collects in a convenient form the philological and archæological materials on which the solution of the question must be based. The chief defect of Dr. Schrader's work is that, being chiefly a philologist, he leaves out of account those anthropological considerations which are no less important than the archæological and linguistic arguments.

The materials accumulated by Dr. Schrader will, however, be so freely drawn upon in the ensuing pages that it will not now be necessary to do more than briefly to state the final conclusions at which he has arrived, and which, it may be added, are substantially those of the present writer.

In discussing the question of the origin of the Aryans, Dr. Schrader thinks there are two fixed points which may be regarded as settled. At the earliest period to which the evidence of history, tradition, or linguistic archæology extends, we find the European Aryans in Northern Europe, and the Asiatic Aryans on the Jaxartes.

As for the European Aryans, he considers that not a particle of evidence has been adduced in favor of any migration from the East. At the earliest time to which the evidence reaches they seem rather to have been extending themselves towards the South and the South-East, and it would appear that the region occupied by them before the linguistic separation must be sought north of the Alps. The precise region can, he thinks, be approximately indicated. The beech does not now grow east of a line drawn from Königsberg to the Crimea, and its northern limit must formerly have been still more restricted. Hence the cradle of the Latin, Hellenic, and Teutonic races, which had the same name for this tree,* must have been to the west of the

* See p. 16, *supra*.

ancient beech-line. But since the Slavo-Lithuanian name is a Teutonic loan-word (old Slavonic *buky*, Russian *buk*, Lithuanian *bukas*), we must place the cradle of the Lithuanians and the Slaves to the east of this line. But since there are philological reasons for believing in the unbroken geographical continuity of the European Aryans previous to the linguistic separation, they must be placed in Northern Europe astride of the beech-line; the Slavo-Lithuanians in European Russia; and the Celts, Latins, Hellenes, and Teutons farther to the West.

As for the Indo-Iranians, there can be no doubt, Dr. Schrader thinks, that the Sanskrit-speaking race entered India from the North-West. In the Vedic period they lived on the banks of the Indus, and had only an indirect knowledge of the Ganges. But the Indians and Iranians must previously have formed a united people somewhere to the north of the Himalaya. Both branches retained traditions of the Jaxartes, the greatest river of this region, and on the banks of this stream we must place their earlier seat.

Hence, in our investigations as to the origin of the undivided Aryans, we have these two fixed points—the earliest known seat of the European Aryans was in Northern Europe, and that of the Asiatic Aryans on the Jaxartes.

The only question which remains is whether the European Aryans came from Asia, or the Asiatic Aryans from Europe?

For the solution of this question Dr. Schrader submits six points for consideration—

(1) The old assumption, that because the Indo-Iranian speech is more archaic than the European, therefore the cradle of the Aryans was towards the East, must be given up, because our knowledge of Zend and Sanskrit dates from an earlier period than our knowledge of the European languages. He thinks, moreover, that the greater rudeness of the European languages is itself the sign of a more primitive condition than the literary culture exhibited by Zend and Sanskrit.

(2) The results yielded by Linguistic Palaeontology are not, he thinks, decisive. We can only conclude that the cradle of the undivided Aryans was in the North, because the words for snow and ice are common to all Aryan languages, and because only two, or at most three, seasons of the year were originally distinguished. To this it may be added that the primitive type of the Aryan race was probably that of one of the energetic Northern races.

(3) We have a right to conclude that the primitive Aryan race, at the time of its geographical continuity, extended over a very large region. A semi-nomadic pastoral people, such as the primitive Aryans doubtless were, must have required a vast space to nurture the cattle necessary for their support. A Tartar family in Central Asia

requires three hundred head of cattle, and occupies rather more than two thousand acres. Hence a tribe consisting of 10,000 people would occupy from 4000 to 6000 square miles. The whole of France would support about 50,000 people as pastoral nomads. and the whole pastoral zone of Northern Europe not more than a million. Before the Aryans had emerged out of the hunting into the pastoral stage, the population must have been still more sparse.

That practically the same language, with dialectic differences, might prevail over a vast region occupied by nomad herdsmen, is proved by the case of the Turko-Tartar race, which, at the time of its greatest extension, occupied a region not far inferior in extent to the hypothetical extension of the primitive Aryans, from the Jaxartes to the Atlantic—about 3000 linear miles. In the sixteenth century the Turkic races extended from the mouth of the Lena as far as the Adriatic, and all these tribes were mutually intelligible, speaking merely dialects of the same language. At the present time a Turcoman from Anatolia is able to understand a Yakut from the shores of the Arctic Ocean.

(4) No sharp line of division can be drawn between the European and the Asiatic branches of the Aryan family. Certain races and languages of Europe are more closely connected with those of Asia than the rest. More especially to be noted are the close relations between the Indo-Iranians and the Greeks, as evidenced by the names of weapons, and of words referring to agriculture and religion.

(5) The grade of civilization attained by the undivided Aryans, as exhibited by the conclusions of linguistic palaeontology, agrees very closely with that disclosed in the oldest Swiss pile dwellings of the stone age. This would indicate the existence of Aryans in Europe at an early epoch, little if at all later than the linguistic separation.

(6) The movements of the Aryan races, according to the earliest historical notices and traditions, were in a southward and to some extent in an eastward direction. If we may credit early tradition, a portion of Western Asia must have received from Europe its Aryan population of Phrygians and Armenians. This tradition is supported by the near relationship of Armenian to the European languages. On the other hand, no indisputable evidence exists of any migration of Aryans from the East to the West.

Such are the materials, according to Dr. Schrader's investigations, on which the solution of the problem depends. The question as to whether the earliest home of the Aryan race was in Europe or in Asia does not, he thinks, admit of any positive answer. But he concludes by withdrawing the opinion which he had formerly expressed that the Aryans had originated in Asia, and says that he is now unable to conceal his conviction that the European hypothesis—that is, the view that the origin of the Aryan race must be sought in the West

rather than in the East—appears to be far more (*weitau*) in accordance with the facts.

The simultaneous publication in 1883 of Penka's and Schrader's books, one treating the question mainly from the side of anthropology, the other from that of philology, drew renewed attention to the Aryan controversy.

The first result was the abandonment of the Asiatic hypothesis by several scholars, who, like Dr. Schrader himself, had supported it in former years. The first to announce his conversion to the new view was Professor Sayce,* a man honorably distinguished by the fact that he has never hesitated to confess that he has seen reason, on the production of fresh evidence, to change opinions which he had formerly advocated. The European hypothesis has also obtained the published adhesion of Professor Rhys, who has ably expounded the new doctrine in the *Princeton Review*. On the Continent it has been espoused by Tomaschek, who declares for Eastern Europe; by Von Löher, who prefers Germany; by Wilsce, who in the main follows Penka; and by Frederich Müller, who agrees with Cuno's selection of Central Europe. Ujfalvy, Hommel, Fessl, Professor Max Müller, and two American writers, Messrs. Hole and Morris, still advocate various forms of the Asiatic hypothesis.

Professor Max Müller, the only surviving scholar of the old school, has recently given a final pronouncement on the subject. He thus writes in 1887:† "If an answer must be given as to the place where our Aryan ancestors dwelt before their separation . . . I should still say, as I said forty years ago, 'Somewhere in Asia,' and no more." At all events, "somewhere in Asia" is more vague, and therefore more probable than Bactria, which was his earlier and more definite selection. But though he says that he retains his old opinion, he does not appear to have made any new additions to his old argument, which was merely Grimm's theory of the "irresistible impulse," and Pott's assumption that migration has always followed the sun's course, westward from the East.

* In *The Academy*, December 8th, 1883; and in his *Introduction to the Science of Language*, third edition, 1885.

† *Good Words*, August 1887, reprinted in "Biographies of Words."

CHAPTER II.

THE PREHISTORIC RACES OF EUROPE.

1.—*The Neolithic Age.*

THE startling revelations as to the antiquity of man in Europe, which succeeded each other with such rapidity in 1860 and the following years, were, as we have seen, a chief cause of the revulsion of opinion as to the origin of the Aryans. The conclusions of the philologists, which had hitherto been accepted without question, had to be revised in the light of the discoveries of geology, archæology and anthropology. The credit of recognizing the changed conditions of the problem is due to Theodor Benfey, himself a philologist. As early as 1868 Benfey ventured to declare that "since it has been established that from immemorial times Europe has been the abode of man, the whole of the arguments which have been adduced in favor of the migration of the Aryans from Asia fall to the ground."*

These investigations as to the primitive inhabitants of Europe have so materially affected the whole question that it will be needful to devote a chapter to a summary of the results which have been attained.

It is no longer possible to confine the existence of man upon the earth to a period of six thousand years. It has been demonstrated that man was a contemporary of the mammoth and the woolly rhinoceros, and followed the retreating ice sheet which had covered Northern Europe during the last glacial epoch.

From astronomical data Dr. Croll has calculated that in the northern hemisphere the last glacial epoch began some 240,000 years ago, that it lasted with alternations of a milder and even tropical temperature for nearly 160,000 years, and finally terminated about 80,000 years ago. With these calculations Professor Geikie essentially agrees.† He believes that palæolithic man must have occupied parts of Western Europe shortly after the disappearance of the great ice sheet, and that there are reasons for supposing that he was interglacial,‡ like the mammoth and the reindeer, whose remains exist below the till, which was the product of the last extension of the glaciers.§

With this remote period we are not concerned. The flint flakes which constitute the earliest evidences of the existence of man in Europe afford no criteria of language or even of race. Nor can we affirm

* See p. 15, *supra*.

† Geikie, *The Great Ice Age*, p. 114.

‡ *Ibid.*, pp. 552-565.

§ *Ibid.*, p. 160.

that the men by whom they were produced were endowed with articulate speech. The men of the quaternary period, the contemporaries of the mammoth, may or may not have been the ancestors of existing races. But coming down to the later, or neolithic period, when the geological and climatal conditions were essentially the same as they are now, we find that three, if not four, of the existing European types occupied approximately their present seats.

Archæologists have established the chronological sequence of the ages of stone, bronze and iron. These are not necessarily synchronous in different countries. Greece had advanced to the iron age while Italy was still in the bronze period, and the rest of Europe in the age of stone. Bronze was used in the Mediterranean lands long before it reached the shores of the Baltic ; and the Guanches were still in the stone age when, in the fifteenth century, the Canary Islands were rediscovered by the Spaniards.

The iron and bronze ages may be excluded from the present inquiry. We need only concern ourselves with the period of polished stone implements, since it has been proved that the ethnology of Europe is now essentially the same as it was before bronze had superseded stone. Bronze weapons were not introduced, as was formerly supposed, by any new conquering race. Their use gradually spread by the peaceful processes of commerce, and largely through the enterprise of Phœnician traders. The pile dwellings of Central Europe, beginning in the stone age, extend over the whole of the bronze age to the age of iron, and prove that in these regions there were no displacements of population by conquest or immigration, but that the same race, inhabiting the same sites, gradually abandoned stone weapons for weapons of bronze, and bronze swords for swords of iron. The same conclusion is established elsewhere by the fact that the oldest types of copper or bronze implements are modeled on the patterns of the earlier implements of stone or bone.

The age of stone has been divided into two epochs—the palæolithic period, or age of chipped flints, and the neolithic period, when the implements were ground or polished. In the palæolithic period man was the contemporary of the cave bear, the mammoth, the woolly rhinoceros, and other extinct carnivora and pachyderms. The climate was severe, the distribution of land and water was different from that which now prevails, pottery, even of the rudest type, was unknown, the people were nomad hunters, living in caves or rock shelters: whereas in the neolithic period the distribution of land and water was essentially the same as it is now, caves were used for burial rather than for habitation, animals had been domesticated, pottery was fabricated, and the European fauna differed little from that which is found at the commencement of the historic period.

Some anthropologists have asserted that Europe was inhabited by

the ancestors of existing races in the palæolithic period. With their arguments we need not concern ourselves, since philologists will probably admit that within the limits of the neolithic age it would be possible to find sufficient time for the evolution and differentiation of the Aryan languages. If it can be shown that the races who inhabited Europe at the beginning of the neolithic period were the ancestors of the races who now inhabit the same regions, we may leave undetermined the question whether they originated in Europe, or whether they emigrated from Asia or from Africa.

It is possible that the palæolithic period may have begun, as M. de Mortillet believes, in the quarternary period of the geologists, some 240,000 years ago; but the neolithic period is comparatively recent. Even M. de Mortillet does not claim for its commencement an antiquity of more than from 10,000 to 20,000 years.

The calculations on which these estimates are based can only be regarded as affording rough approximations to the truth, and they must be taken only for what they are worth.

Some of the best of these natural chronometers are found in Switzerland. But even the earliest Swiss lake dwellings exhibit a state of civilization considerably more advanced than the civilization which linguistic palæontology demands for the primitive Aryans. Consequently we obtain from them only a minimum and not a maximum limit of time for Aryan settlement.

At Pont de la Thièle, between the Lakes of Bienne and Neufchâtel, there is a pile dwelling of neolithic age which is now 3,000 feet inland from the present shore of the lake. A calculation made by Professor Gilliéron of the rate at which the lake is being filled up with sediment would give for the foundation of this settlement a minimum antiquity of 6,750 years, or about 4,900 B. C.* At this time, therefore, the neolithic people had abandoned the nomad life of the undivided Aryans, and had acquired the skill requisite to build their habitations on piles driven into the bed of the lake; but how much earlier the neolithic period may have begun we have no means of ascertaining.

At the neighboring settlement of Chamblon, on the Lake of Neufchâtel, there is a later pile dwelling, founded towards the close of the neolithic period. A calculation of the rate at which the lake is being filled up with sediment shows that this settlement must have begun before 1,500 B. C.†

M. Morlot considers that the age of the oldest neolithic lake dwellings in Switzerland may be from 6,000 to 7,000 years. Dr. Keller thinks this is too much, and prefers 3,000 to 4,000 years as a safer

* See Keller, *Lake Dwellings*, p. 462; Lyell, *Antiquity of Man*, p. 29; Lubbock, *Prehistoric Times*, p. 401; De Mortillet, *Le Préhistorique*, p. 621.

† G. de Mortillet, *Le Préhistorique*, p. 618.

estimate.* But these structures belong to a comparatively late part of the neolithic period. Some of the pile dwellings in Southern Germany belong to an earlier period in which there were no domestic animals, and when even the rudiments of agriculture were unknown.

From the growth of the cone of the delta of the Tinière, a small stream which falls into the Lake of Geneva near Chillon, a calculation has been made by M. Morlot, which, making every probable deduction, would show that about 6,400 years ago Switzerland was inhabited by people who used implements of polished stone, while for the stratum in which bronze implements were found we have a probable antiquity of about 3,800 years. Hence in Switzerland the epoch of bronze must almost certainly be as old as 1,000 B.C., and may possibly be older by another thousand years.

This estimate agrees essentially with that obtained from the pile dwellings in the valley of the Po, which began in the neolithic age, but, as Helbig has shown,† had reached the bronze age when they were destroyed by the invasion of the Etruscans, which must have been earlier—how much earlier we do not know—than the middle of the eleventh century B.C. The bronze period must therefore have commenced considerably before this date.

The burnt city at Hissarlik, and the tombs at Mycenæ, excavated by Dr. Schliemann, also belong to the age of bronze. They are generally assigned to the twelfth or thirteenth century B.C.

Localities which were further removed from the influences of Semitic civilization were more backward, and hence the foregoing calculations are not irreconcilable with those of M. Arcelin, who from the rate of deposition of the alluvium of the Saône has come to the conclusion that as late as 1,150 B.C. stone implements were still exclusively used in Central Gaul, and that about 400 B.C. bronze had not yet been replaced by iron.

The Victoria Cave, near Settle, in Yorkshire, was inhabited by neolithic people who had made considerable advances in civilization, having apparently domesticated the ox, and possibly the horse. From the accumulation of *débris*, due to the slow weathering of the limestone rock, Professor Boyd Dawkins has calculated that the neolithic occupation of this cave ceased between 4,800 and 5,000 years ago, or before 3,000 B.C.‡

The stone implements found in the kitchen middens or shell mounds of Denmark are more archaic in character than those from the Swiss lake dwellings; indeed, they are considered by some authorities to be mesolithic, forming a transition between the palæolithic and neolithic periods. The people had not yet reached the agricultural or even the

* Keller, *Lake Dwellings*, pp. 526-528.

† Helbig, *Die Italiker in der Poebene*, p. 100.

‡ Dawkins, *Cave Hunting*, p. 115.

pastoral stage—they were solely fishermen and hunters, the only domesticated animal they possessed being the dog, whereas even in the oldest of the Swiss lake dwellings the people, though still subsisting largely on the products of the chase, had domesticated the ox, if not also the sheep and the goat. The shell mounds belong, therefore, to a very early stage of the neolithic period, the civilization which they disclose being ruder than that of the undivided Aryans.

The accumulation of these mounds must have occupied an enormous period. They are very numerous, and some of them are more than 900 feet long, and from 100 to 200 feet broad. They are usually from three to five feet, but occasionally as much as ten feet, in thickness. They are composed of the shells of oysters and mussels, of the bones of animals and fish, with occasional fragments of rude pottery, and numerous implements of flint or bone, and similar refuse of human habitation.*

The flint tools are so abundant that in an hour and a half two visitors collected from one of the mounds 380 specimens. As the population subsisted solely on fishing and the chase, it must have been extremely sparse, probably as thinly scattered as are the Eskimos and the Fuegians, who are in a similar stage of civilization. If the population was as dense as that of the former territories of the Hudson Bay Company, the neolithic population of Denmark would not have exceeded 1,500; if it was as dense as in Patagonia, it must have been under 1,000; and, if as sparse as in Australia before the settlement of Europeans, not half as much.†

Making every allowance, it is manifest that such enormous heaps of refuse, and such a vast quantity of implements could only have been accumulated during long periods of time, many centuries at least, more probably several millenniums.

But the time when the kitchen midden period came to a close must be itself remote, as is proved by the alteration of the coast-line and by the change of climatic conditions which have taken place.

Some of these mounds are now at a considerable distance from the sea, which can only be due to the slow secular elevation of the land, which is still in progress at the rate of a few inches in a century. In other places the mounds are wanting, evidently owing to the encroachment of the sea.

We have in Denmark three successive periods of vegetation—first, the age of fir; second, the age of oak; and, third, the age of beech. In the Roman period the country was covered, as it now is, by vast forests of beech, the fir and the oak having then disappeared. These changes in the vegetation are attributed to slow secular changes of climate. Now the stone age agrees mainly with that of the fir, and partly with that of the oak; the bronze age agrees mainly with the

* Lubbock, *Prehistoric Times*, pp. 230-233.

† *Ibid.*, pp. 607, 608.

period of the oak, and the iron age with that of the beech. The shell mounds, which belong to the early neolithic period, are proved to belong to the age of the fir, since the bones of the capercailzie, a bird which feeds on the young shoots of the fir, have been found in the kitchen middens, while stone implements of the kitchen midden type have been discovered in the peat bogs among the stumps of the firs. Taking these considerations into account, Professor Steenstrup, the highest authority on the subject, is of opinion that a period of from 10,000 to 12,000 years must be allowed for the accumulation of the vast mounds of refuse and for the successive changes of the forest trees from fir to oak, and from oak to beech, which can only be due to considerable changes of climate—changes, moreover, which had already been effected at the commencement of the iron age.*

Another chronometer is afforded by the peat, in which, at various depths, neolithic implements are buried. Professor Steenstrup has calculated that from 4,000 to 16,000 years would be required for the formation of certain of these peat bogs. The presence of pottery proves that the shell mounds belong to the neolithic age, the commencement of which can hardly therefore be placed later than 10,000 years ago.

2.—*The Methods of Anthropology.*

Broca has laid down the axiom that the ethnic characteristics of the first order of importance are not linguistic but physical. As to the nature of the speech of the neolithic peoples of Europe we have inferences rather than any positive facts to guide us. As to their physical characteristics the evidence is abundant and conclusive. This evidence consists partly of the statements of Greek and Roman writers, but is derived mainly from the measurements of skulls. The shape of the skull is one of the least variable characteristics of race, so much so that the skulls from prehistoric tombs make it possible to prove that the neolithic inhabitants of Europe were the direct ancestors of the existing races. The skull form is expressed by the numerical ratios of certain measurements which are called indexes. Of these the most important are the latitudinal, or, as it is commonly called, the cephalic index, which gives the proportion of the extreme breadth to the extreme length of the cranium; the altitudinal or vertical index, which gives the proportion of the height of the skull to the length; the orbital index, which gives the proportion of the height of the eye orbit to the breadth; the facial angle; the nasal index; and the index of prognathism, by which we estimate the shape of the face. These indexes, taken in conjunction with the shape of certain bones, especially the femur and the tibia, enable us to determine with con-

* Penka, *Herkunft der Arier*, p. 62.

siderable certainty, the ethnic relationship of prehistoric to existing races.

The latitudinal or "cephalic" index is thus determined: Divide the extreme breadth of the skull by the length from front to back, and multiply by 100. Thus, if the breadth is three-fourths of the length, the index is said to be 75. Cephalic indexes vary from 58 to 98.

The term dolichocephalic, or long-headed, is applied to skulls with low indexes; brachycephalic, or broad-headed, to those with high indexes; and orthocephalic, or mesocephalic, to the intermediate class. The black races are dolichocephalic, the white races incline to orthocephalism, and the yellow races to brachycephalism. Anthropologists are not entirely agreed as to the precise limits of index to which these terms should be restricted, but we shall not be far wrong if we call skulls with indexes below 75 dolichocephalic, from 75 to 78 sub-dolichocephalic, from 78 to 80 orthocephalic, below 83 sub-brachycephalic, and of 83 and over brachycephalic. The Swedes are the most dolichocephalic race in Europe, the Lapps the most brachycephalic, the English the most orthocephalic. North Germany is sub-dolichocephalic, South Germany, sub-brachycephalic.

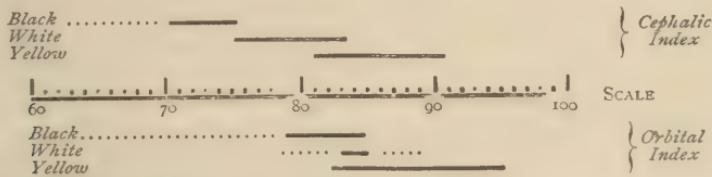
The orbital index, which gives the proportion of the height to the breadth of the orbit is believed by Broca to be of especial value as a test of race, since it is not liable to be affected by causes connected with the struggle for existence. Among the black races it is lowest, varying, in Africa, from 79.3 to 85.4, and descending to 61 among the Tasmanians; among the yellow races it is high, varying from 82.2 to 95.4; among the Europeans it is usually between 83 and 85. A similar test applies to the section of the hair. In the Mongolian or yellow race it is circular; in the black or African race it is flat or ribbon-shaped; in the white or European race it is oval. The hair of the Mongolian is straight, that of the African frizzled or woolly, that of the European is inclined to curl.

All these tests agree in exhibiting two extreme types—the African, with long heads, long orbits, and flat hair; and the Mongolian, with round heads, round orbits, and round hair. The European type is intermediate—the head, the orbit, and the hair are oval. In the east of Europe we find an approximation to the Asiatic type; in the South of Europe to the African. The neolithic tombs of Europe exhibit notable approximations both to the African and to the Asiatic types.

The position of the European races between the African and the Asiatic may be exhibited graphically by the diagram on the following page.

Where, it has been asked, did the human race originate? Darwin inclines to Africa, De Quatrefages to Asia, Wagner to Europe in the miocene epoch, when the climate was sub-tropical. If it originated in

Europe we may suppose it was differentiated into the extreme Asiatic and African types ; or, on the other hand, Europe may have been the place where the African and Asiatic types met and mingled. Those who hold the former view may believe with Penka that the Aryans



represent the oldest European race ; those who hold the latter opinion may maintain that while Aryan speech came originally from Asia it was subsequently acquired by men who were largely of African race.

3.—*The Races of Britain.*

In Cæsar's time there were in Gaul three races—the Aquitanians, the Celts, and the Belgæ ; as well as a fourth race, the Germans, eastward of the Rhine. In the neolithic tombs of Europe the remains of these four races can be traced, and from them alone the Aryan-speaking peoples of Europe have descended. But it is evident that only one of these four races can represent the primitive Aryans, the others being merely Aryan in speech, but non-Aryan by descent.

On the Continent there were no insurmountable physical obstacles to impede the immigration of intrusive races ; but in Britain the "silver streak" has rendered the ethnological problem less complicated. At the beginning of the bronze age we discover in British tombs the remains of two out of the four races of the Continent. One of these arrived towards the close of the neolithic age, before which time Britain seems to have been inhabited by one race only, which may possibly have descended from the people of palæolithic times, and who may even have migrated from the Continent with the great pachyderms before the formation of the channel.

The older race was of feeble build, short stature, dark complexion, and dolichocephalic skull. They buried their dead in caves, and when caves were no longer available, in long barrows provided with interior chambers and passages. Some of these long barrows are 400 feet in length and fifty feet in breadth, and resemble artificial caves—imitations or survivals, as it were, of the earlier sepulchral caverns. The long barrows are plainly of later date than the cave sepulchres. Thus in a sepulchral cave at Cefn, near St. Asaph, the skulls are of precisely the same type as those in a long barrow at the same place, but their relative antiquity is shown by the fact that the remains of wild animals are rare in the barrow but common in the cave. Plainly

the people had reached the pastoral stage when the cave was abandoned for the barrow.* The long barrows all belong to the stone age. Canon Greenwell asserts that "no trace of metal has been found . . . in any undisturbed part of a long barrow," while "pottery of any kind is very unfrequent."† In barrows of this description, from Caithness to Wiltshire, the skulls are all of one type, and archaeologists are agreed that in the long barrow period Britain was inhabited by one race only.

This race is identified by ethnologists with the British tribe of the Silures, who at the time of the Roman Conquest inhabited the counties of Hereford, Radnor, Brecon, Monmouth, and Glamorgan. From their physical characteristics Tacitus concluded that they belonged to the Iberian race. His words are, "Silurum colorati vultus torti plerumque crines, et posita contra Hispania, Iberos veteres trajecisse, easque sedes occupasse, fidem faciunt."‡

No importance must be attached to the conjecture that the Silures had emigrated from Spain. It was a guess, based on a valuable observation as to the physical resemblance of this swarthy British tribe to the Iberians.

Modern ethnologists have made the same observation, and have more especially noted the resemblance of the Spanish Basques to the small dark Welshmen of Denbighshire. The same type is found in some of the Hebrides, especially in Barra. It is found in Kerry, and also west of the Shannon, in Donegal and Galway, notably in the Isle of Aran in Galway Bay, where in an old graveyard Dr. Beddoe found four dolichocephalic skulls, with a mean index 74.25, the lowest in the British Isles.§ Dr. Beddoe also found an approach to this index in the region occupied by the Silures, five skulls from Micheldean giving a mean index of 74.8. In a more or less modified form this type prevails throughout the Silurian region of Wales and the west of England, where we find an oval-featured race, of short stature and feeble muscular development, with dolichocephalic skull, dark hair, and black eyes.||

The Continental extension of this type will be discussed hereafter.¶ Suffice it to say that skulls resembling those of the British long barrows have been found in sepulchral caves in Belgium, France, Spain, Algeria and Teneriffe. It is believed that descendants of this race may be recognised among the Basques, the Corsicans, the Berbers and the Guanches of the Canary Islands.

* Dawkins, *Cave Hunting*, pp. 164, 165.

† Greenwell, *British Barrows*, pp. 543, 508.

‡ Tacitus, *Agricola*, c. II.

§ Beddoe, *Races of Britain*, p. 227.

|| Greenwell, *British Barrows*, p. 630; Elton, *Origins of English History*, pp. 137, 141; Dawkins, *Early Man in Britain*, p. 330; Penka, *Origines Ariacæ*, p. 90.

¶ See p. 54, *infra*.

For this short, dark dolichocephalic type we may adopt the usual and convenient name "Iberian." Professor Rolleston prefers the term "Silurian," and it has been variously designated by other writers as the Euskarian, Basque, Berber or Mediterranean race. By some French writers it is called the "Cro-Magnon" type, from a skull, possibly of palæolithic age, found in a sepulchral cavern at Cro-Magnon in Périgord.

Towards the close of the neolithic age, or possibly at the beginning of the bronze age, the southern and eastern portions of Britain were invaded and occupied by a wholly different race—tall, muscular, brachycephalic, and almost certainly with xanthous or rufous hair and florid complexion. They are known as the people who buried in round barrows, and to them in all probability we may ascribe the erection of Avebury and Stonehenge,* and also the first introduction into Britain of Aryan speech and of implements of bronze. This race Dr. Thurnam identifies with the Celts, and he calls the type the "Turanian" type, believing it to be an offshoot, through the Belgic Gauls, from the great brachycephalic stock of Central and North-Eastern Europe and Asia. It is also the prevailing type among the Slavonic races. This "Turanian" type of Dr. Thurnam is the "type Mongoloide" of Prüner-Bey. By Professor Rolleston it is called the "Cimbric" type, on the ground that it resembles that of the broad-headed neolithic people of Denmark, the old Cimbric Chersonese. Dr. Thurnam identifies the round barrow people of Britain with the broad-headed neolithic race of Belgium and North-Eastern France, who undoubtedly spoke a Celtic language, and who are designated by Broca as the Kymry, to distinguish them from the short, dark brachycephalic race of Central France, to whom he maintains the name Celts properly belongs. But as there can be little doubt that the people of the round barrows introduced into Britain what is usually called "Celtic" speech, it will be convenient, though perhaps incorrect, to designate the people of the round barrows as the Celtic race.

The interments of these two races, the "Iberians" of the long barrows and the "Celts" of the round barrows, can be readily distinguished. The skulls, as Canon Greenwell observes, are "as markedly different as any two series of crania can be."† The difference is well exhibited in the skulls on next page, both from the wolds of the East Riding of Yorkshire, and here reproduced by Canon Greenwell's kind permission. The first is the skull of a middle-aged man of the "Iberian" race, found at Rudstone,‡ in a long barrow, 210 feet long, and varying in breadth from 75 to 45 feet. It is of a pronounced dolichocephalic type, the index being as low as 72. The second is the skull of a man also in the middle period of life, of the other, or "Celtic"

* Elton, *Origins*, p. 146.

† Greenwell, *British Barrows*, p. 482.

‡ Greenwell, *British Barrows*, pp. 501, 613.

race, which was found in a round barrow, 70 feet in diameter, in the neighboring parish of Cowlam.* This skull is decisively brachycephalic, the index being as high as 84. Flint implements accompanied both of these interments, but no articles of metal.



LONG BARROW SKULL (MALE),
FROM RUDSTONE, E. R.

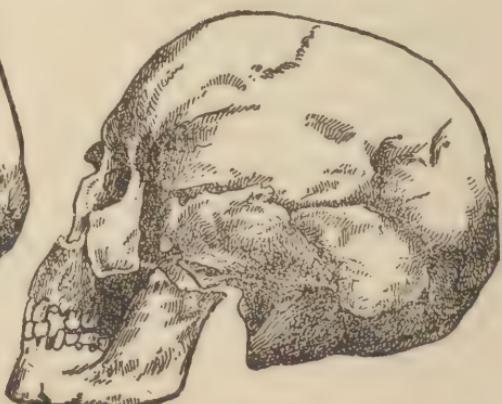


ROUND BARROW SKULL (MALE), FROM
COWLAM, E. R.

The two races are distinguished not only by the difference in the shape of the skull, but by the whole character of the face. In the



COWLAM SKULL (SIDE VIEW).



RUDSTONE SKULL (SIDE VIEW).

Celtic skull, of which that from Cowlam is a favorable specimen, the head is massive and powerful, the face angular and prognathous, with a projecting mouth and powerful square jaws. The broad capacious

* *Ibid.*, pp. 226, 587.

forehead and the short, square chin indicate mental power and determination of character. The cheek bones are high and broad, the orbits of the eyes nearly circular, with supraciliary ridges well developed, which must have given a fierce and beetling aspect to the face. The nose must have projected forwards, and the sockets of the front teeth are oblique. The skulls of this race are usually distinguished by their capacity and vertical height, which is actually greater than the breadth.*

To this type the skulls of the Iberian race present the greatest possible contrast. The face is oval, feeble, and orthognathous; the forehead narrow; the chin weak, pointed and elongated. The nose is usually not so broad as in the other race, but longer by a quarter of an inch, the space between the nostrils and the mouth considerable, giving a weak upper lip, and the sockets of the front teeth are vertical. Neither the cheek bones nor the supraciliary ridges are developed, and the orbits of the eyes are somewhat elongated. The aspect of the face must have been mild and gentle. The vertical views of these two skulls show that the greater length of the one, and the greater breadth of the other, are mainly due to occipital developments. The difference in the skulls extends also to the other bones of the skeleton. The Iberian race was short, with slender bones and feeble muscular attachments, while the Celtic race was tall, powerful and muscular.

In both races the distinctive characters are less highly accentuated in the skulls of the women, as will be seen from the representations of two female skulls from the Yorkshire wolds—one a long skull of the Iberian type, orthognathous, with an index of 68, from a barrow on Sherburn wold;† the other a broad skull of the Celtic type from a neighboring barrow at Flixton,‡ strongly prognathous, and with an index of 82.

From ninety-five round barrow skulls we obtain a mean cephalic index of 81, and a mean altitudinal index of 77; while sixty-seven long barrow skulls give a mean cephalic index of 71.25, and a mean altitudinal index of 73.

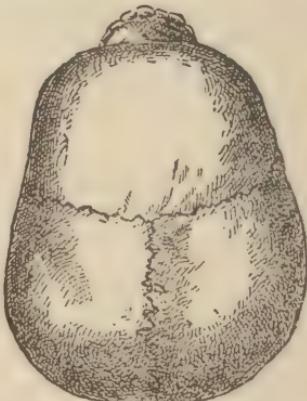
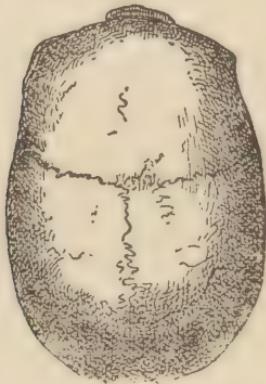
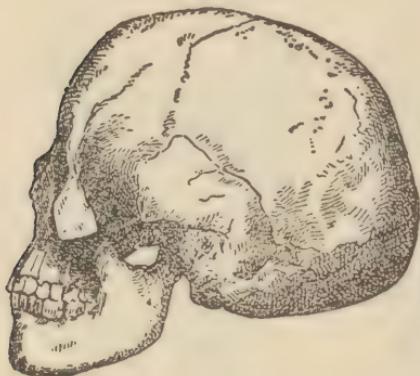
The difference of stature between the two races is considerable. In the Iberian race the average height for both sexes was 5 feet 4½ inches (or 5 feet 5½ inches for the men), the tallest of the men measuring 5 feet 6 inches, and the shortest of the women 4 feet 8 inches. In the Celtic race the height, calculated from the length of the thigh bones, ordinarily varied from 5 feet 7 inches to 5 feet 9 inches, the average height being 5 feet 8½ inches.

The stature of the Celts struck the Romans with astonishment. Cæsar speaks of their *mirifica corpora*, and contrasts the short stature

* Greenwell, *British Barrows*, p. 645.

† Greenwell, *British Barrows*, p. 608. ‡ *Ibid.*, p. 575.

of the Romans with the *magnitudo corporum* of the Gauls. Strabo also, speaking of the Coritavi, a British tribe in Lincolnshire, after mentioning their yellow hair, says, "to show how tall they are, I saw myself some of their young men at Rome, and they were taller by six inches than any one else in the city."* This might seem an exagger-



LONG BARROW SKULL (FEMALE), FROM
SHERBURN WOLD, E. R.

ROUND BARROW SKULL (FEMALE), FROM
FLIXTON WOLD, E. R.

ation, but is borne out by the bones found in some round barrows. For instance, at Gristhorpe, in the East Riding, a round barrow was opened containing the skeleton of a man whose stature must have been 6 feet 2 inches.

There can be little doubt that the Iberian race was dark in complexion, with black hair and eyes. As to the Celtic race, it is almost certain that they were fair, with red or yellow hair, and blue or blue-gray eyes. The most conclusive statement comes from Dio Cassius, who has left us a description of Boadicea, who almost certainly belonged to this race. He describes her as of great bodily proportions, *ἡν δὲ καὶ τὸ σῶμα μεγίστη*. The fierceness of her appearance struck

* Elton, *Origins*, p. 240.

beholders with awe, and the expression of her countenance was exceedingly severe and piercing. Her voice was harsh, and she had a profusion of tawny hair, $\tauήν τε χόμην πλείστην τε καὶ ξανθοτάτην$, which reached down to her hips. The word $\xiανθός$ is used for various tawny shades of color, either golden, or auburn, or with a tinge of red.

We have other testimonies to the same effect. Lucan says the Britons were *flavi*; Silius Italicus describes their hair as golden; and Vitruvius, referring seemingly to the same race, speaks of their huge limbs, their gray eyes, and their long, straight, red hair.

The Coritavi, the Celtic tribe which occupied part of Lincolnshire and the valley of the Trent, are described by Strabo as having yellow hair, but not so yellow as that of the Gauls; and Tacitus mentions the red hair and huge limbs—*rutilæ comæ et magni artus*—of the Caledonians, who, in this respect, he compares with the Germans.

The Belgic Gauls, who, as we shall presently see, were probably of the same race as the round barrow people of Britain, are uniformly described by ancient writers as tall, large-limbed, and with red or yellow hair. Pösche, Diefenbach, and De Belloguet have collected numerous testimonies to this effect.* Thus, according to Diodorus Siculus, the Galatians were xanthous, $\tauαῖς δὲ χρυσαῖς . . . ξανθοῖ$. Livy describes the *promissæ et rutilatæ comæ* of the Gauls. Claudian says, *flava repexo Gallia crine ferox*. Ammianus Marcellinus describes the great stature, the white skin, and the red hair of the Gauls. Silius Italicus speaks of the huge limbs and golden locks of the Boii; and Strabo says the Germans resembled the Gauls, but were taller, more savage, and more xanthous. Manilius, speaking of the tall Germans with their yellow hair, says that the Gauls were not so red.

The old Celtic type, tall, powerful, red-haired, with a florid complexion, and inclined to freckle, may be recognized in some of the Scotch clans, such as the MacGregors and the Camerons, who are altogether different from the Frasers, or the dark clans of the Western Isles.

In Ireland there were the same two races, which are graphically described by McFirbis in his *Book of Genealogies*. One race, which he calls the Fir-Bolg, had dark hair and eyes, small stature, and slender limbs, and constituted the despised servile class of the Irish people. They belong, says Mr. Skene, “to the same class with the Silures, and may be held to represent the Iberian race which preceded the Celtic.” The other race, called the Tuatha Dè Danann by McFirbis, was tall, with golden or red hair, fair skin, and blue or blue-gray eyes. They “correspond in character with Tacitus’ large-limbed and red-haired Caledonians.”†

* Pösche, *Die Arier*, p. 25; Diefenbach, *Origines Europææ*, p. 161; De Belloguet, *Ethnogenie Gauloise*, ii., pp. 63, seq.

† Skene, *Celtic Scotland*, vol. i., p. 178; cf. Elton, *Origins*, p. 159.

As to the relative priority of the Iberian and Celtic races in Britain there can be no question. The Iberians were plainly the primitive inhabitants of the Island, and the Celts were later invaders, who were not only a more powerful race, but possessed a higher civilization. This is indicated by the form of the barrows in which they buried. The abodes of the dead represent the abodes of the living. The Iberians must at one time have been troglodytes, as the long barrow is plainly a survival of the cave. The Celts must have lived in huts or pit dwellings, on the model of which the round barrows are constructed. In the long barrows metal is absent and pottery is rare, while the presence of pottery is a distinctive feature of the round barrows,* and bronze is not unknown.

As bronze has been found in round barrows, it is frequently asserted that the Celts were armed with bronze weapons when they invaded Britain. This conclusion is not borne out by the evidence, which indicates that the Celts arrived in the neolithic period, and obtained bronze by commerce from Gaul at a later time. Canon Greenwell tabulates 485 interments in round barrows; in 201 cases these were associated with pottery, in 150 cases with implements of stone, bone, or horn, and in only twenty-three with bronze. Of these twenty-three cases only five were primary interments, fifteen were secondary interments, and the rest doubtful.

Mr. Mortimer, who has opened 241 round barrows in the East Riding, containing 629 bodies, found pottery in 203 cases, stone implements in 150, and bronze in twenty-six. These facts make it probable that when the round barrows were first erected bronze was either unknown or extremely rare, but that it had to some extent come into use when secondary interments took place in barrows which had been raised at an earlier period.

Moreover, no brachycephalic skull has been found in any primary interment in a long barrow, though they occur in secondary or later interments; while in the round barrows the skulls are usually brachycephalic, though dolichocephalic skulls are occasionally found in them, especially on the Yorkshire wolds.†

From these facts we may confidently draw the conclusion that during the greater part of the neolithic age Britain was inhabited solely by a short, dark, dolichocephalic race, originally troglodytes, and that towards the conclusion of the stone age it was invaded by a tall, fair, brachycephalic, hut-building race, which either brought with them, or before long acquired, implements of metal.

We may also accept Dr. Thurnam's conclusion that the older dolichocephalic race was pre-Aryan, belonging to the same stock as the Spanish Basques, and that the later brachycephalic invaders spoke an Aryan language, which there can be little doubt was Celtic.

* Greenwell, *British Barrows*, pp. 508, 458-478.

† *Ibid.* pp. 543, 549.

If these conclusions, now very generally accepted, can be maintained, we have reached a fixed point in the discussion as to who the Aryans were. The first Aryan-speaking race which appeared in Britain was brachycephalic, tall, and red-haired, of the type characterized by Professor Rolleston as "Turanian," and by Prüner-Bey as "Mongoloide."

It is not improbable, as Professor Rhys has suggested, that there may have been two successive Celtic invasions of Britain. The first, he thinks, was that of the Goidels, who spread to Ireland and Scotland, amalgamating with the Iberian aborigines, and imposing on them their language. The second invasion was that of the Brittones, who seized the more fertile portions of the island, driving the Goidels before them to the West and North.* This theory helps to explain some linguistic facts, and is not without support from craniological indications.

The mean index of Dr. Thurnam's long barrow skulls is, as we have seen, 71.25, and that of the round barrow skulls of Yorkshire 81. But in North Wales, and in Professor Huxley's skulls from the tumulus at Keiss in Caithness—districts where we might expect to find an amalgamation of the two races—the mean index is 75.5, which may represent the mixed "Goidelic" type of Professor Rhys.

4.—*The Celts.*

We have now to trace the two neolithic British races on the Continent—the Celtic type eastward to the confines of Asia; the Iberian type southward through France and Spain to Northern Africa.

The Celts appear to have crossed to Britain from Belgic Gaul. In the neolithic age a race indistinguishable from that of the British round barrows occupied Belgium. A sepulchral cave at Sclaigneaux, fourteen miles from Namur, contained numerous skeletons of the round barrow type, with indexes of 81.1 and 81.6. Implements of bone and flint, of late neolithic forms, were found, but no bronze. Bones of the dog, the ox, and the goat indicate that these people had reached the pastoral stage.†

The skull figured on the next page resembles some of the ruder skulls from the British round barrows.

In the early neolithic age the southern frontier of the Belgic Gauls seems to have been the line of the Meuse. They held the modern province of Hainault; while another race, as will presently be shown, occupied the province of Namur.‡ At a later time they advanced southward, imposing their Celtic speech on the earlier races of Central France. In the artificial sepulchral grottoes on the Marne and

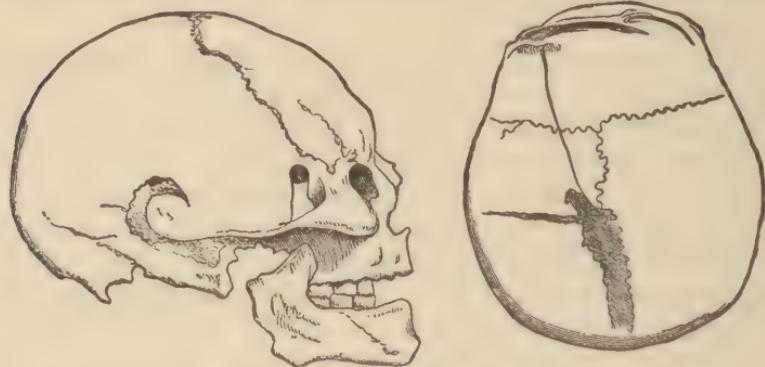
* Rhys, *Celtic Britain*, p. 213.

† Dawkins, *Cave Hunting*, pp. 219, 199.

‡ See p. 69, *infra*.

the Oise skulls of this race are found, together with those of the earlier population.

This race may also be traced eastward to Denmark. Dr. Rolleston observes that "the bronze period Briton very closely resembles in his



SKULL FROM SCLAINEAUX, BELGIUM.

osteological remains the brachycephalous Dane of the neolithic period ; and the likeness between these and some of the modern Danes has been noticed by Virchow."* From a neolithic tumulus at Borreby, in the Danish island of Falster, four skulls of the round barrow type



MALE SKULL FROM BORREBY, DENMARK.

were obtained, whose indexes were 80, 81, 82, and 83. One of these Borreby skulls is figured below,† and bears a striking similarity to the ruder skulls from the British round barrows.

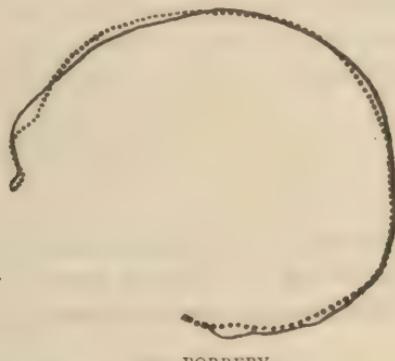
This resemblance will be seen by superimposing the outline of the

* Greenwell, *British Barrows*, p. 680.

† Hamy, *Précis de Paléontologie Humaine*, p. 368.

Borreby skull on that of a Celtic skull from Ilderton in Northumberland,* the index of which is 82.

In Denmark this brachycephalic type has been singularly persistent. To judge by the skulls of Flambard, and other Danish ecclesiastics buried at Durham, the Danes 800 years ago were brachycephalic. According to Dr. Beddoe the modern Danes are of the same type as



SKULLS FROM BORREBY AND FROM ILDERTON, NORTHUMBERLAND, SUPERIMPOSED.

the round barrow people. The mean cephalic index of the Danes is 80.5, and their average height nearly 5 feet 7 inches; the mean index of the round barrow people being 81, and their mean stature 5 feet 8 1/2 inches. The hair of the Danes, according to Dr. Beddoe, is either pale yellow or light brown, and their eyes are almost invariably light in color, usually either blue or bluish-gray. Some of the Danes, however, seem to have been dark. Dr. Beddoe found a black-haired race in the island of Moen, where brachycephalic skulls have been found in ancient graves. These black-haired Danes may be the Dubhgaill, or "black strangers," who are contrasted by Irish chroniclers, who describe the Viking inroads, with the Finngaill, or "fair strangers," who are supposed to have been Norwegians.† Possibly we may thus account for the tall, dark brachycephalic people who are met with in some of the Danish districts in England.

At the beginning of the historic period the valleys of the Main and the Upper Danube were occupied by Celtic tribes. In this region Celtic names abound. The Boii, a Celtic people, gave their name to Bavaria (Boio-varia), and to Bohemia (Boio-hemum).

The ethnic frontier between Celts and Teutons was the continuous mountain barrier formed by the Teutoberger Wald, the Thuringer Wald, and the Riesen Gebirge. North of this line the population is now dolichocephalic, the index in the neighborhood of Hanover, for instance, being 76.7, and at Jena 76.9, while to the south of this line the people are more brachycephalic, the mean index being 79.2 in

* Greenwell, *British Barrows*, p. 583.

† Skene, *Celtic Scotland*, vol. i. p. 304.

Hesse, 79.3 in Swabia, 79.8 in Bavaria, 80 in Lower Franconia, and 80.1 in the Breisgau.*

The people of the modern kingdom of Würtenberg are also brachycephalous. Hölder, the chief authority on the anthropology of Würtenberg, now considers the type to be "Turanian," or "Sarmatian," and not, as he had formerly supposed, "Ligurian."

German ethnologists believe that a Celtic people worked the salt mines in the neighborhood of Halle, a name which, like that of Hallstadt, also a Celtic settlement, is more easily explained from Celtic than from Teutonic speech. The present inhabitants of this district differ from the North German type; they are brachycephalic, with a mean index of 80.5, which is the same as that of the Danes, and differs little from that of the round barrow skulls of Britain, which is 81.

Halle seems to have been the most northern outpost of the Celts in Germany, since beyond the Teutoberger Wald, a few miles to the north of Halle, the type changes, and the mean cephalic index drops from 80.5 to 76.7.

Southern Germany is now Teutonic in speech, the local names and the persistent ethnic type alone bearing witness to the primitive Celtic occupation. We know, however, that in the early centuries of our era Southern Germany was Teutonized in speech by German invaders, whose tombs, known as the Row Graves, contain dolichocephalic skulls with a mean index of 71.3. The older Celtic sepulchres of this region are known as the Grave-Mounds, and contain orthocephalic or brachycephalic skulls with a mean index of 78.8, rising to a maximum of 82.9.

In Würtenberg and Bavaria a number of pile dwellings of the neolithic age have been discovered which seem to be prototypes of those which are so numerous in the Swiss lakes. These people must gradually have spread southwards from Germany, since the older pile dwellings on the Lake of Constance belong to an earlier period than those on the lakes of Neufchâtel and Bienne.

The Swiss craniologists, His and Rütimeyer, attribute the erection of the lake dwellings in Switzerland to "our Celtic ancestors," the Helvetii.† The mean index of eight skulls ‡ found in the pile dwellings is 80.95. The index of the round barrow skulls of Britain is 81. One of these Helvetic skulls, called the "Sion type" in the *Crania Helvetica*, is figured on the next page. It resembles the round barrow skulls, such as those from Cowlam and Grishorpe, and the Borreby skull from Denmark.§ But, as we might expect from the comparatively high civilization attained by the people of the Swiss pile dwell-

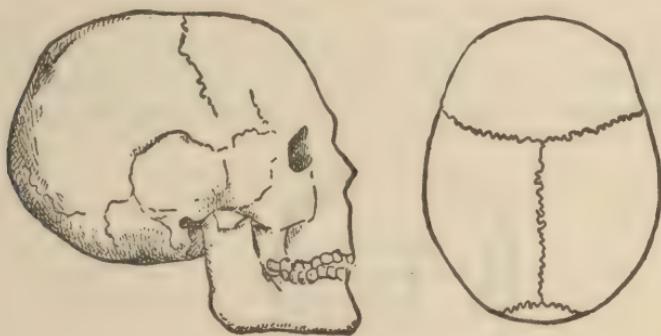
* Peschel, *Völkerkunde*, p. 59. † His and Rütimeyer, *Crania Helvetica*, pp. 34, 35.

‡ The indexes are—Auvernier skulls, 77.2 and 78.5; Nidau, 78 and 78.4; Möringen, 83; Meilen, 83.2; Pfiedwald, 83.8; Robenhausen, 85.5. If Robenhausen be excluded, as possibly Rhætian, the mean index will be reduced to 80.03.

§ See pp. 42, 79, *supra*.

ings, their skulls are somewhat larger, loftier, and better formed than the ruder skulls of the British round barrows.

Towards the close of the neolithic age the same Aryan-speaking race which constructed the Swiss pile dwellings seems to have crossed the Alps, erecting their pile dwellings in the Italian lakes and in the marshes of the valley of the Po. Helbig has proved that these people must be identified with those whom we call the Umbrians.* This conclusion, established solely on archæological grounds, is confirmed by the close connection between Celtic and Italic speech, and also by



HELVETIAN SKULL (SION TYPE).

the almost identical civilization disclosed by the pile dwellings of Italy and those of Switzerland.

Further, the craniologists have proved that while the people of Southern Italy are dolichocephalic, belonging apparently to the Iberian race, they become more and more brachycephalic as we go northward, especially in the district between the Apennines and the Alps. In Venetia, Lombardy, and the Emilia, the region occupied by the Umbrians, Professor Calori has measured 1,106 modern skulls, of which 963, or 87 per cent., were brachycephalic, with indexes above 80. In Lombardy and the Emilia dolichocephalic skulls, with indexes under 74, amounted to less than 1 per cent. In the Neapolitan provinces, on the other hand, 17 per cent. of the skulls had an index below 74, and 64 per cent. below 80.† The mean index of the Umbrian skulls found in a pre-Etruscan cemetery at Bologna is 79.35, and the index of a typical ancient Umbrian skull, which is figured by Professor Calori, is 81.79.

Latin and Umbrian were merely dialects of the same language, but in Rome there was a large admixture of Etruscan and Campanian blood. Skulls of the pure Latin race are rare, owing to the prevalent practice of cremation, while skulls ostensibly Roman often prove on investigation to be those of freedmen or provincials. The best accredited genuine skull of the old Latin race comes from a sarcophagus

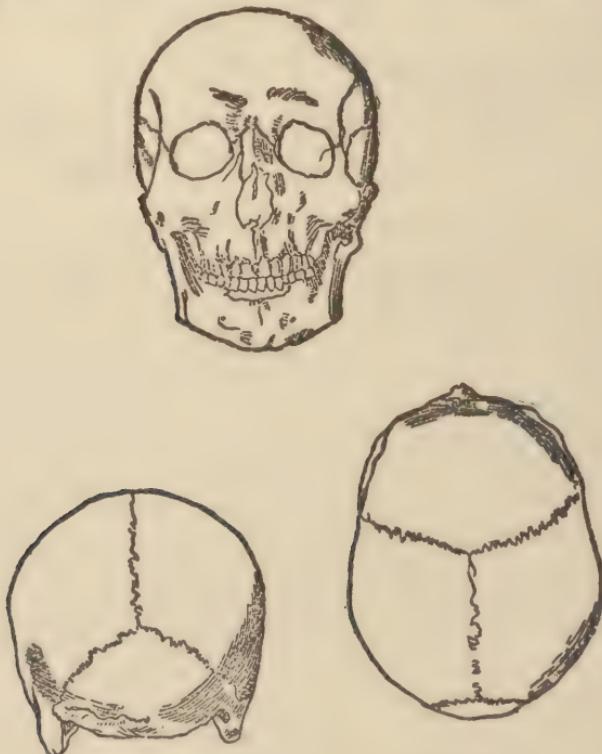
* Helbig, *Die Italiker in der Poebene*, pp. 29-41.

† Peschel, *Völkerkunde*, p. 60.

discovered in the Roman cemetery at York. We learn from the inscription that this sarcophagus contained the body of Theodorianus of Nomentum, a town in Latium. This skull, figured below, is of the brachycephalic Celtic type, the cephalic index being 80.

There is very remarkable resemblance in the outlines of the Latin and Helvetian skulls, and those of the better class from the British round barrows. They exhibit no greater differences than the refinement of type due to the progress from neolithic barbarism to the high civilization of Rome.

The oldest Umbrian settlements—such as the pile dwellings in the Lake of Fimon, near Vicenza—prove that the Umbrians, when they arrived in Italy, were in much the same stage of civilization as the undivided Aryans. They lived chiefly by the chase, but had domesti-



SKULL OF THEODORIANUS OF NOMENTUM.

cated the ox and the sheep. Agriculture, even of the rudest description, seems to have been unknown, since no cereals were found ; but there were considerable stores of hazel nuts, of water-chestnuts, and of acorns, some of which had been already roasted for food.*

Before the arrival of the Umbro-Latin race, Italy was inhabited by Iberian and Ligurian tribes. In the neolithic cave at Monte Tignoso,

* Keller, *Lake Dwellings*, vol. i. p. 375.

near Leghorn, two skulls were found—one of them dolichocephalic, with an index of 71, doubtless Iberian; the other highly brachycephalic, with an index of 92, probably Ligurian. Another neolithic cave, the Caverna della Matta, contained an Iberian skull, index 68, and a Ligurian skull, index 84. The Olmo and Isola del Liri skulls, believed to be of palaeolithic date, are dolichocephalic.

The round barrow race, which we have now traced from the Tyne to the Tiber, extended eastward down the Danube, and across the great plain of Russia. All the nations of Slavic speech are brachycephalic, and their hair and eyes are mostly light in color.

The Great Russians, who occupy the territory east of a line from the Sea of Azov to the Gulf of Finland, have chestnut hair, brown eyes, and a mean index of 80.2. The White Russians, who occupy the old Lithuanian territory, have flaxen hair, and gray or light blue eyes. Black hair and eyes are only found among the Little Russians, near Kiev, who are probably largely of Tartar race.

The index of the Ruthenians in Galicia is 80.4; of the Slovaks, 81; of the Croats, 82; of the Czechs, 82.1; of the Roumanians, who are to a great extent of Slavic blood, 80; of the Poles, 79.4; of the Serbs, 78.8.*

The same light-haired brachycephalic type prevails also when we pass beyond the frontier of Aryan speech into Finno-Ugric territory.

The Finno-Ugric tribes are all brachycephalic, and most of them have light eyes and fair or rufous hair. Of the Wotiks 50 per cent. have blue eyes; the rest are gray, green, or brown eyed, black eyes being unknown. In only 2 per cent. the hair is black. It is usually brown or red, and occasionally flaxen. The Zyrianians of the Petschora have also fair hair and blue eyes.† Many of the eastern Finns, especially the Tscheremis, the Tschuvash, the Woguls, and the Ostiaks of the Obi, have red hair, and the eyes are blue, gray, green, or chestnut. The cephalic index varies from 80.4 to 83.7, and the index of their kinsmen, the Magyars, is 82.3. The Tavastian Finns have flaxen hair and blue or gray eyes; the Karelians chestnut hair and grayish-blue eyes. Both races are brachycephalic, the Karelians less so than the Tavastians, the index varying from 81.48 to 83.7. The Estonians are fair, with yellow or flaxen hair and blue eyes. They are brachycephalic, with a mean index of 80.48.

Vambéry describes the Turcomans as ordinarily blonde. The mean cephalic index of the Mongols is 81, which is precisely that of the round barrow people, whom they resemble in their prognathism, their high cheek bones, and the squareness of the face. In all these

* Peschel, *Völkerkunde*, p. 59. Weisbach's measurements are somewhat higher. He gives for the Ruthenians 82.3; Poles, 82.9; Czechs, 83.1. Broca gives 82.8 for the Roumanians, and 84.83 for the Croats.

† Pösche, *Die Arter*, p. 136.

particulars the Cowlam skull, figured on page 42, agrees very closely with the Mongol type.*

The foregoing investigation has brought us to the conclusion at which Dr. Thurnam arrived many years ago. He says that to him it appears to be proved that the type of the Celtic skull, at least that of the dominant race in the bronze period in Britain, was of the brachycephalic "Turanian type." How the Celtic became the language of a people with this Turanian skull-form, and how this Turanian skull-form became the skull-form of a Celtic and so-called Indo-European people, are questions which he thinks are yet to be determined. Meanwhile, he continues, the idea of a connection between the ancient Celtic brachycephalic type, and that of the modern Mongolian or Turanian peoples of Asia, cannot be overlooked, and remains for explanation.

In the following pages an attempt will be made to find an answer to the enigma which Dr. Thurnam has so lucidly propounded.

5.—*The Iberians.*

It has been shown in the preceding section that some of the chief European races—the Celts, the Danes, the Umbrians, the Romans, and the Slaves—belong to the brachycephalic type found in the neolithic round barrows of Britain. We have seen that they stretch in a broad, continuous zone across Central Europe into Asia. We have now to trace the dolichocephalic long barrow race through Belgium, France, and Spain, and to identify them with their existing representatives.

The Iberians, as they may be conveniently called, were an Atlantic and Mediterranean race. They do not seem to have reached Germany or North-Eastern Europe. Their furthest extension in this direction is marked by a sepulchral cave at Chauvaux on the Meuse, not far from Namur, which contained skulls of the long barrow type, with a cephalic index of 71.8, together with pottery of the neolithic age.†

Before the arrival of the brachycephalic Ligurian race, the Iberians ranged over the greater part of France. We trace them in the valleys of the Seine, the Oise, and the Marne,‡ frequently in association with the remains of the Ligurian invaders.

If, as seems probable, we may identify them with the Aquitani, one of the three races which occupied Gaul in the time of Cæsar, they must have retreated to the neighborhood of the Pyrenees before the

* The Gristhorpe skull figured in the *Crania Ethnica*, Fig. 104, is strikingly Mongolian.

† Dawkins, *Cave Hunting*, p. 217.

‡ De Baye, *L'Archéologie Préhistorique*, p. 129.

beginning of the historic period. It is in this region, mainly in the valley of the Garonne, that their sepulchral caves are the most numerous.

Some of these caves, such as those at Bruniquel, Laugerie Basse, Aurignac, and Cro-Magnon, have been assigned to palæolithic times; but as this early date is now disputed,* and as the remains in these older caverns differ to some extent from those of the long barrows, it will be safer to begin by leaving all doubtful interments out of account, and confine ourselves to caves whose neolithic age is undisputed. For the determination of the characteristics of this Iberian or Aquitanian race no more typical sepulchre can be selected than the celebrated Caverne de l'Homme Mort in the Department of the Lozère. It lies in an inaccessible and desolate ravine which traverses a barren limestone plateau. Here the feeble Iberian race seems to have maintained itself for a time, after the more fertile surrounding lands had been seized by the brachycephalic intruders, whose descendants now occupy the region. In this cave some fifty persons must have been interred, and in fifteen cases the skeletons have been so well preserved as to admit of accurate measurement, and even of the determination of the sex.

No such extensive series of neolithic skeletons, all belonging to the same type and to the same period, has been found elsewhere. The skulls have been described by Paul Broca, the most eminent of French anthropologists,† whose careful measurements establish the identity of this race with the long barrow people of Britain. Like them, they were orthognathous and dolichocephalic, with oval faces, mild features, weak and slender forms, and short stature. They agree both in the shape of the skull and in the peculiar formation of the bones of the leg. The tallest of those buried in this cave slightly exceeded 5 feet 5 inches, the mean stature being 5 feet 3¾ inches. The mean stature of the skeletons in the Perthi-Chwareu cave in Denbighshire was 5 feet 4 inches, that of the long barrow people 5 feet 4½ inches.

The long barrow people of Britain were, as we have seen, extremely orthognathous. This is the most characteristic feature of the skulls in the Caverne de l'Homme Mort. The Guanches and the Corsicans are the most orthognathous of existing races, and next to them come the Spanish Basques. The men of the Caverne de l'Homme Mort plainly belong to the same racial group, being more orthognathous even than the Guanches.

These races agree also in constituting a great leptorhinic group, distinguished by an extremely low nasal index. This index is for the Guanches, 44.25; for the Berbers, 44.28; for the Spanish Basques, 44.71; and for the Caverne de l'Homme Mort, 45.46. They agree

* De Baye, *L'Archéologie Préhistorique*, p. 20.

† Broca, *Revue d'Anthropologie*, vol. ii., pp. 1-53.

also in cranial capacity. The mean for male skulls is, for the Corsicans 1,552 cubic centimetres; for the Guanches, 1,557; and for the Spanish Basques, 1,574. In the Caverne de l'Homme Mort, it rises to 1,606.

The orbital index constitutes, in Broca's opinion, one of the surest tests of race. The orbital index of the Guanche mummies and of the skulls in the Caverne de l'Homme Mort is lower than that of the Spanish Basques, which is the lowest of any existing European race. It would be tedious and needless to discuss in detail the characteristics of the skulls in the neighboring sepulchral caves of this region. It may suffice to say that some of the most eminent of the French anthropologists—Broca, Mortillet, and De Quatrefages—consider that the people of the Caverne de l'Homme Mort were the survivors of an earlier race which inhabited the same region in the reindeer period, whose remains have been found in caves at La Madeleine, Laugerie Haute, Aurignac Laugerie Basse, and Cro-Magnon. This earlier race was tall, athletic, and prognathous. In spite of these differences the general osteological characters are the same, the cephalic index is the same, the mean index at Cro-Magnon being 73.34, and in the Caverne de l'Homme Mort, 73.22. Broca moreover affirms that of all the skulls with which he is acquainted, the nearest approach to the unique and exceptional skull of the old man interred in the Cro-Magnon cavern is to be found in two Guanche skulls in the Museum at Paris.

Certain characteristic peculiarities in the forms of the bones of the leg and the arm which distinguish the Cro-Magnon skeletons are seen in an attenuated form in several of the skeletons in the Caverne de l'Homme Mort,* as well as in some of the Welsh caves, notably in the Cefn Cave near St. Asaph and the Perthi-Chwareu Cave in Denbighshire, where we find interments which may be ascribed to remote ancestors of the people of the long barrows.†

The chief importance of the skeletons of the Cro-Magnon type is that in stature, prognathism, and the shape of the orbits they exhibit

a greater approximation to the negro-type than any others which have been found in Europe.

The Iberian race seems to have extended over the whole Spanish peninsula as well as the coasts and islands of the Mediterranean. In the Genista Cave at Gibraltar two skeletons were discovered with orthognathous and dolichocephalic skulls, which, according to Busk, resemble those



SKULL FROM GENISTA CAVE.

found in the Perthi-Chwareu Cave in Denbighshire, and those of the

* Mortillet, *Le Préhistorique*, p. 610.

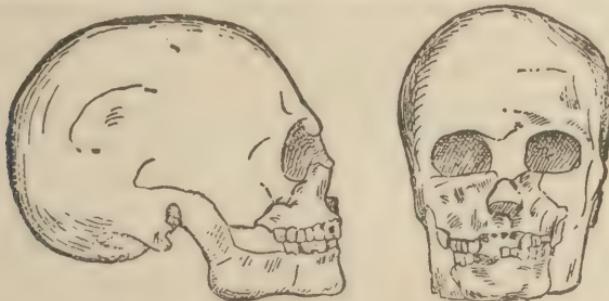
† Dawkins, *Cave Hunting*, pp. 155-159.

Spanish Basques. One of the Genista skulls had a cephalic index of 74.8 and an altitudinal index of 71.4, and one of the Denbighshire skulls had a cephalic index of 75 and an altitudinal index of 71. The agreement could hardly be more exact.*

In the Canaries we find an interesting survival of the customs of these French and Spanish troglodytes. The Guanches of Teneriffe must be regarded as an isolated branch of the Berber race, preserving in great purity the primitive type and mode of life. In Pliny's time the Canaries were uninhabited. When occupied by the Spaniards at the beginning of the fifteenth century the natives were still in the stone age, using caves both for habitation and sepulture. Mummied bodies from the Tenerife caves are in most of the museums of Europe. The mean cephalic index of these mummies is 75.53; in the Genista Cave at Gibraltar it is 75.5; in the Denbighshire caves, 76.5; in the Caverne de l'Homme Mort, 73.22. The mean index of the Berbers is 74.63; of the Corsicans, 75.35; of the Spanish Basques, 76; of the ancient Egyptians, 75.58.

The same race inhabited Corsica, Sardinia, Sicily, and Southern Italy. In prehistoric caves of Italy and Sicily dolichocephalic skulls of the long barrow type have been found.† Seneca informs us that Corsica was peopled by Ligurians and Iberians. Pausanias says that the Sardinians were Libyans, a people whose existing representatives are the Berbers. We learn from Thucydides, and also from a passage of Ephorus preserved by Strabo, that the oldest inhabitants of Sicily were Iberians.

These statements are confirmed by modern craniological measurements. It is found that the dolichocephalic type maintains itself in Southern Italy; while Northern Italy is overwhelmingly brachy-



SKULL OF A MAN FROM HISSARLIK (BRONZE AGE).

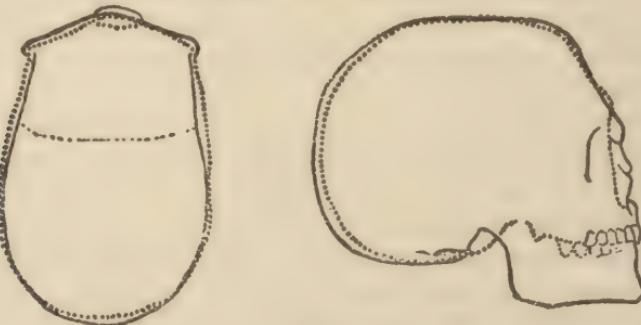
cephalic. In the former States of the Church Professor Calori found 24 per cent. of the inhabitants were dolichocephalic, with indexes below 74, and only .04 per cent. in Lombardy.

The ethnology of Greece is obscure, but it is probable that the

* Dawkins, *Cave Hunting*, p. 171. See also the figures on p. 72, *infra*.

† See pp. 52, 53, *supra*.

pre-Hellenic Autochthones belonged to the Iberian race, and that the Hellenic invaders were the same type as the Umbrians and Romans. Some light is thrown on this question by Dr. Schliemann's excavations at Hissarlik. He discovered four skulls, which have been put together and described by Professor Virchow. One skull, decidedly brachycephalic, with an index of 82.5, was found in the second or neolithic stratum.* This may perhaps be referred to the Ligurian race, which it resembles in some striking features. The other three skulls,† found in the burnt city, which is of the bronze age, have indexes respectively of 68.6, 71.3, and 73.8, giving a mean index of 71.23, which agrees with that of the long barrow skulls. They are orthognathous, and in their outline bear some resemblance to those from the Genista cave at Gibraltar, though the cephalic index is lower.



— TROY.
.... GIBRALTAR.
SKULLS FROM TROY AND GIBRALTAR SUPERIMPOSED.

Unfortunately all the skulls from Hissarlik were so fragile and imperfect as to make it unsafe to draw from them any positive conclusions. Virchow doubtfully refers them to the old Hellenic type, and it is possible that he may be right.

The Iberian race was probably of dark complexion, with black hair and eyes. Their presumed descendants, the Welshmen of Denbighshire, the Irish of Donegal and Kerry, the Corsicans, the Spanish Basques, and the Berbers are swarthy. On the other hand, the Kabyles are of lighter tint, and blue eyes are not uncommon among them, while some of the Guanche mummies appear to have been fair-haired. The Tuareks of the Sahara are fair-haired and blue-eyed.

But the complexion and the color of the hair and eyes is of less value as an anthropological characteristic than the shape of the skull and of the orbits of the eyes. It is believed that under certain circumstances fair races may become dark, and dark races light, the cuticle, however, being affected sooner than the hair or the iris of the eyes. In the southern, as in the northern hemisphere, we find a zone of

* See p. 67, *infra*; Schliemann, *Ilios*, p. 271.

† *Ibid.*, pp. 508, 511.

lighter colored people running through the temperate regions. The Caffres of South Africa are not so black as the negroes of the tropics, and in South America the Patagonians and the Fuegians are lighter in tint and taller in stature than the races nearer the equator. Some of the Araucanians of Chili are almost white. The physical strength and great stature which distinguish the northern Europeans are reproduced under similar conditions of climate among the Patagonians.

The Cro-Magnon people were exclusively hunters and fishers ; they had no domestic animals and no cereals. They were acquainted with fire, and were clad in skins, which they stitched together with bone needles. They wore collars and bracelets of shells strung together, and painted or tattooed themselves with metallic oxides. They were not destitute of religious ideas, since they believed in a future life ; the care bestowed on the interments and the objects deposited with the deceased proving that they thought the spirits of the dead had wants beyond the tomb, and were able to make use of ornaments and weapons.*

From distant parts of Europe where the remains of the Iberian race are found there is evidence that they were occasionally addicted to cannibalism. Such evidence is supplied by human bones which have been broken in order to extract the marrow. The best authenticated cases come from a cave in the island of Palmaria in the Gulf of Spezzia,† from Keiss in Caithness,‡ and from the Césareda Caves in the valley of the Tagus.§

If, as is contended by Broca and De Quatrefages, the Cro-Magnon people exhibit a remote ancestral type of the Iberian race, the question of the ultimate origin of the Iberians would be greatly simplified. Broca considers that their resemblance to the Berbers shows that they immigrated into Europe from Africa, while the resemblance of the Guanche and Berber skulls to those of the ancient Egyptians allies them to the great Hamitic stock, the Cro-Magnon skeletons forming a link between the Berbers and the negroes.

On the ground that the Iberian type is found as far north as Caithness, Professor Boyd Dawkins believes in its Asiatic origin. The difficulty in the way of this view is that, while the Iberian type of skull stretched continuously in neolithic times from Britain through France and Spain to Africa, it has not been found in Northern Europe east of Namur.

If, however, the abnormal Neanderthal skull may be regarded as a remote prototype of the typical Scandinavian skull, and if the equally abnormal Cro-Magnon skull may be regarded as an archaic form of the Iberian type, the difficulty would not be so great, as these two

* De Quatrefages, *Hommes Fossiles*, p. 68.

† Dawkins, *Cave Hunting*, p. 259. ‡ *Ibid.*, p. 197. § *Ibid.*, p. 146.

abnormal types agree more closely than the less savage types which prevailed in more recent periods.

6.—*The Scandinavians.*

In Britain three cranial types characterize the three ages of stone, bronze, and iron. The "Iberian" type is distinctively neolithic, the "Celtic" type prevailed in the bronze period, while in graves of the iron age a new type appears, which we may call the "Scandinavian" or "Teutonic."

The skulls from these Anglo-Saxon graves, although dolichocephalic, like those from the long barrows, are unmistakably dissimilar. The forehead is more retreating, the cranial vault lower, and the mean cranial capacity much less, in the one case amounting to 1,524 cubic centimetres, or 93 cubic inches, in the other only to 1,412 cubic centimetres, or 86 cubic inches.

The bony structure of the face is also different. The Iberians were highly orthognathous, the Anglo-Saxons somewhat prognathous. The Anglo-Saxon jaw was powerful, the Iberian weak. The Iberian face, during life, would appear feeble, owing to its narrowness, and especially to the long, weak chin, whereas the facial bones of the Anglo-Saxons were massive. Moreover, one race was tall, often over six feet, the other exceptionally short.

An earlier and more typical form of the Teutonic skull, which is known as Ecker's "Row Grave" type, with a mean index of 71.3, has been found in numerous graves of the iron age in the south-west of Germany. These are assigned to Frankish and Alemannic warriors of the fourth and following centuries. This Row Grave type differs hardly at all from a type with a mean index of 70.7 found in graves of the post-Roman period in Western Switzerland, which is called the Hohberg type by the authors of the *Crania Helvetica*. That the Hohberg type is that of the Burgundians has been established by the recent discovery at Bassecourt, some eighteen miles south-west of Basel, of a Burgundian cemetery containing five skulls of the Hohberg type, with indexes varying from 70.1 to 73.9, giving a mean index of 72.3.*

The Row Grave men were tall, often upwards of six feet in height, in which they resemble the Swedes, who are the tallest existing race in Europe. The forehead is narrow, the brow low and retreating, the cranial vault low, the nose narrow but prominent, the orbital ridges are well marked, and the back of the skull greatly developed.

This Row Grave type of skull having been found over the whole region of Gothic, Frankish, Burgundian, and Saxon conquest, as well

* Kollman, *Craniologische Gräberfunde in der Schweiz*, p. 360. (Verhandlungen der Natürforschenden Gesellschaft in Basel, vol. vii., 1882.)

in England as in France, Spain, Italy, and Eastern Europe, it must be taken to represent the type of the old Teutonic race. It still survives in Sweden, as Ecker has shown by a comparison of his Row Grave skulls, whose mean index is 71.3, with two modern Swedish skulls, having indexes of 69.5 and 72.2.

Owing probably to the infusion of Slavonic or Celtic blood this type is practically extinct in other Teutonic lands, with the exception of certain Frisian districts, notably the islands of Urk and Marken in the Zuyder Zee, where Virchow claims to have discovered pure descendants of the old Frisian race. These islanders are more platycephalic even than the Hottentots, the mean altitudinal index being as low as 69.8, while in a characteristic skull from Marken, which Virchow has figured, it is only 67. Nowhere else are skulls of the Neanderthal type so numerous as here.*

In the neolithic age this platycephalic type extended from the mouths of the Rhine to the Neva, and as far south as Galicia. It has been found by Schaffhausen in Westphalia and by Virchow east of St. Petersburg. In prehistoric Pomeranian graves Dr. Lissauer has found platycephalic skulls with an index of 70, and a cranial capacity of less than 80 cubic inches, lower than that of the Bosjemen, and not far above that of the Neanderthal skull, which is estimated at 75 cubic inches. Nilsson and Von Düben affirm that in the neolithic period, and throughout the bronze and iron ages, down to the present time, the same type has continuously prevailed in Sweden.

The lands vacated by the Goths, Vandals, and Burgundians in Northern Germany were re-occupied by brachycephalic Slaves, who have since been Teutonized.

Denmark, though Scandinavian in speech, is no longer purely Scandinavian in blood. The modern Danes belong rather to the brachycephalic Slavo-Celtic type; but whether by blood they are Celts or Slaves is doubtful.

At all events the change of type began early, as is proved by the neolithic tumulus at Borreby, in the island of Falster,† where we find dolichocephalic skulls of the Row Grave type, with indexes as low as 71.8, but mostly between 72 and 73, together with brachycephalic skulls resembling those of the British round barrows, with indexes usually between 80 and 83, but in one case as high as 85.7. No craniologist would admit that they can belong to the same race.

The interments in the Borreby tumulus seem to indicate that the dolichocephalic aborigines were conquered, and probably Aryanzied, by brachycephalic invaders of the same Slavo-Celtic race which buried in the round barrows of Britain, while the dolichocephalic skulls from Borreby must be assigned to the people of the shell mounds.

* Virchow, "Anthropologie der Deutschen," in *Transactions of the Berlin Academy* for 1871, p. 52.

† See p. 48, *supra*.

The most undoubted representative skull of this kitchen midden race comes from Stængenæs in Sweden, where, in 1844, Nilsson discovered in an undisturbed portion of a kitchen midden, at a depth of 3 feet, the skeleton of a man whose stature exceeded 5 feet 10 inches, and whose skull was of a marked dolichocephalic type, with an index between 72 and 73.*

The kitchen middens belong to the early part of the neolithic age, if indeed they are not mesolithic, bridging over the supposed hiatus between neolithic and palæolithic times. The French Anthropologists are inclined to believe that the ancestors of the Scandinavian race may be traced still further back, and be identified with the savages who peopled Northern Europe in the palæolithic age. But as some doubt attaches to this conclusion, we may provisionally designate them as the Canstadt race—a name given to them by De Quatrefages and Hamy from a skull found in 1700 at Canstadt, near Stuttgart, associated, it is said, with bones of the mammoth. A similar skull was discovered in 1867, together with remains of the mammoth, at Eguisheim, near Colmar, in Alsace.

The celebrated Neanderthal skull (index, 72), found near Dusseldorf in 1857, is less human and more simian in character than any other known skull, but is nevertheless classed by Hamy and De Quatrefages as belonging to their Canstadt type. Its precise age is doubtful, and it would be unsafe to regard it as the type of a special race, since its characteristics, as we shall presently see, have been occasionally reproduced in modern times.

A more favorable specimen of this type is the celebrated skull (index, 70.52) which was found seventy miles south-west of the Neanderthal in a cavern at Engis, on the left bank of the Meuse, eight miles south-west of Liège. It was embedded in a breccia with remains of the mammoth, the rhinoceros, and the reindeer. It has usually been referred to the the quaternary period, but as a fragment of pottery was found in the same deposit it is possible that the contents of the cave may have been swept in by water, so that the skull may be only of neolithic age.

Of this Engis skull Virchow writes: "It is so absolutely dolichocephalic that if we were justified in constituting our ethnic groups solely with reference to the shape of the skull, the Engis skull would without hesitation be classed as belonging to the primitive Teutonic race, and we should arrive at the conclusion that a Germanic population dwelt on the banks of the Meuse prior to the earliest irruption of a Mongolic race."

In the oldest skulls of the Canstadt race the ridges over the eyes are greatly developed, the cranial vault is low, the forehead retreat-

* Nilsson, *Les Habitants primitifs de la Scandinavie*, quoted by De Quatrefages, *Hommes Fossiles*, p. 19; cf. Hamy, *Précis*, p. 129.

ing, the eye orbits enormous, the nose prominent, but the upper jaw is not so prognathous as the lower. This primitive savage, the earliest inhabitant of Europe, was muscular and athletic, and of great stature. He had implements of flint, but not of bone, and was vain of his personal appearance, as is proved by his bracelets and necklaces of shells. He was a nomad hunter, who sheltered himself in caves, but was without fixed abodes, or even any sepulchres.

The chief interest that attaches to these repulsive savages is that French anthropologists consider them to be the direct ancestors of their hereditary enemies the Germans, while German anthropologists assert that the Teutons are the only lineal representatives of the noble Aryan race. How far this contention can be maintained we shall hereafter see.

That the earliest inhabitants of Europe belonged to the Canstadt race may, however, probably be granted, since skulls of this type have been found underlying those of the Iberian and Ligurian races in the very oldest deposits at Grenelle;* while in many cases there are indications, more or less trustworthy, of the Canstadt race having been contemporary with the extinct pachyderms.

Its chief habitat seems to have been the valley of the Rhine, but it extended to the south as far as Würtemberg, and to the east as far as Brüx in Bohemia. Only at a later time, when the reindeer had retreated to the north, it reached the shores of the Baltic.

Though this type has now become extinct in Germany, owing to the prepotence of the Celtic or Turanian race, and though it has been favorably modified by civilization in Scandinavia, yet even in modern

times we find curious instances of atavism or reversion to an earlier type. These cases are found chiefly among men of Norman or Scandinavian ancestry. Such may occasionally be noticed in the Scandinavian districts of England. The skull of Robert Bruce, who was of pure Norman blood, exhibits a case of such reversion. Another case is that of the skull of St. Mansuy.



SKULL OF ST. MANSUY, BISHOP OF TOUL.

Mansuy, or Mansuel, the Apostle of Belgic Gaul, who in the fourth century became Bishop of Toul in Lorraine. A still more remarkable case is that of Kai-Likke, a Danish gentleman who lived in the seventeenth century, whose skull is of the Neanderthaloid or Canstadt type, with receding forehead, and an enormous development of the supraciliary ridges.†

Zeuss, Pösche, Penka, and other writers ‡ have collected a large

* See p. 69, *infra*.

† De Quatrefages, *Hommes Fossiles*, pp. 61-64.

‡ Zeuss, *Die Deutschen*, p. 50, *seq.*; Pösche, *Die Arier*, p. 25, *seq.*; Penka, *Or. Ar.*, p. 122; Diefenbach, *Or. Eur.*, p. 161, *seq.*; De Belloguet, *Eth. Gaul.*, ii., p. 64, *seq.*

number of passages from ancient authors which show that the Germans had the tall stature, yellow hair, and blue eyes of the modern Scandinavians. Ausonius describes the blue eyes and yellow hair of a Suevic maiden. Lucan mentions the *flavi Suevi*, Claudian the *flavi Sicambri*, Martial the *flavorum genus Usipiorum*.

Tacitus speaks of the *truces et cœrulei oculi, rutilæ comæ, magna corpora* of the Germans, and according to Calpurnius Flaccus, *Rutili sunt Germanorum vultus et flavi proceritas*, and Procopius describes the Goths as tall and handsome, with white skins and fair hair.

There is a superficial resemblance between the Teutons and the Celts, but they are radically distinguished by the form of the skull. No anthropologist would admit that the Row Grave skulls and the round barrow skulls could belong to the same race. Both races, however, were tall, large-limbed, and fair-haired. But the pink and white complexion of the Teuton is different from the more florid complexion of the Celt, who is inclined to freckle. The eyes of the pure Teutons are blue, those of the Celts green, gray, or grayish-blue. The hair of the Teutons is golden; that of the Celts is often fiery red. In the Roman period the Gauls are described as resembling the Germans, but not so tall, so fair, or so savage.

De Quatrefages has conjectured that this race may have roamed farther to the East. He thinks the type may be recognized in the Ainos of Japan and Kamtshatka, and in the Todas of the Neilgherries, who bear no resemblance to any of the contiguous tribes. Both the Ainos and the Todas are fully dolichocephalic, differing in this respect from the Japanese and Dravidians, who are brachycephalic. The profile is of the European type, and instead of the scanty beard of the Mongolians and Dravidians, they are as amply bearded as the Scandinavians, and, like many North Europeans, they have much hair on the chest and other parts of the body.

7.—*The Ligurians.*

Cæsar found three races in Gaul, differing in language, laws, and customs. The Aquitani in the South-West have been identified with the long barrow "Iberian" race of Britain; the Belgæ in the North-East were probably of the same race as our own round barrow people; while the Celtæ occupied the central region between the Garonne to the South-West, and the Seine and the Marne to the North-East. Who these Celtæ were is one of the problems of ethnology.

A few years ago they were unhesitatingly identified with the speakers of what we call the "Celtic" languages, the Irish and the Welsh. But in two very ingenious papers, whose arguments have convinced many of the French anthropologists, Broca* has maintained that there

* Broca, "La Race Celtique Ancienne et Moderne" (*Revue d'anthropologie*, vol. ii., pp. 577-628); and "Qu'est ce que les Celtes?" (*Mémoires*, vol. i., p. 370).

never have been any Celts in Great Britain or Ireland, that no British people ever called themselves Celts, or were so called by ancient writers, and that they do not possess the physical characters of the Celts of history. The real Celts, he considers, are the people of Central France, who are the descendants of the Celts of Cæsar; so that the term Celt is an ethnological misnomer, if applied to either of the two British races by whom what is commonly called "Celtic speech" is spoken—either the tall, red-haired brachycephalic Irishman and Scot, or the short, dark, dolichocephalic race of Donegal, Galway, Kerry, and South Wales.

A small portion of the Bretons, he says, are the only Celts by race who speak a "Celtic" language; and in this case their Celtic speech was acquired from the fugitives who fled to Brittany at the time of the Saxon Conquest of Wessex.

The hilly region of Central France, which was occupied by the Celts of Cæsar, has been continuously inhabited, as Broca maintains, by their lineal descendants, a short, dark, brachycephalic race, who are the true Celts of history and ethnology, as distinguished from the so-called Celts of philology and popular archaeology. This type, which cannot with any certainty be traced among the existing population of Great Britain, or in the British barrows, is found in its greatest purity in Auvergne, Dauphiny, Savoy, the Grisons, and the Maritime Alps.

There can be no doubt, however that, at the time of the Roman Conquest, Cæsar's Celts, the people of Central Gaul, spoke what we call a "Celtic" language; but, as will hereafter be shown, there are reasons for believing that this may have been only an acquired tongue, imposed on them by the Belgic Gauls, and not their primitive non-Aryan form of speech. This acquired tongue was, however, the Aryan language of the so-called "Celtic" people of Britain, and hence modern philologists have assumed an identity of race when there was merely an identity of language.

The true "Celts" of Central France are of short stature, black-haired, and extremely brachycephalous, having a mean index of 84. The so-called Celts of the British round barrows were, as we have seen, tall, with hair probably rufous or flavous, and only moderately brachycephalous, with a mean index of 81. Many English writers, ignoring Broca's arguments, identify the two races; and they contend that the shorter stature and the darker hair of the race of Central France arose from a union of the short, dark, dolichocephalic Iberians



SKULL OF AUVERGNAT.

with the tall, fair, brachycephalic people of the round barrows. But in such case the resulting type would be intermediate between the two parent types ; and it is difficult to understand how a race with an index of 72 uniting with another having an index of 81 should have resulted in a race with an index of 84, or how the cross of a tall, fair race with a short, dark race should have produced a hybrid race shorter and darker than either of the parent races.

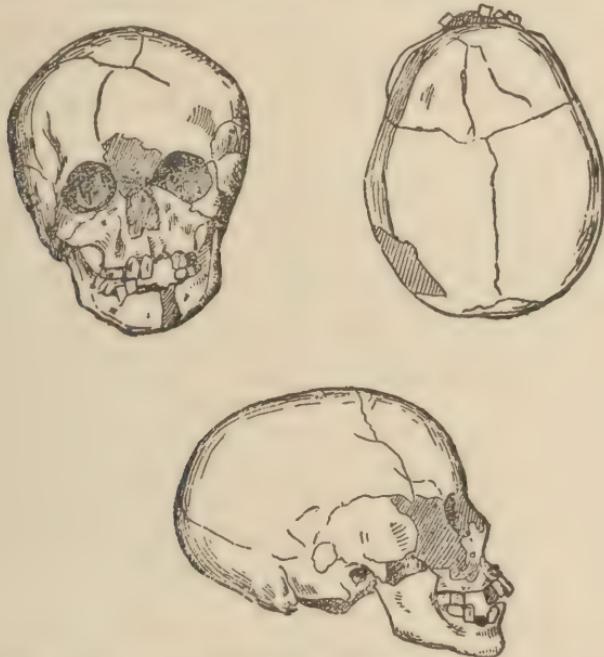
These difficulties will have to be explained before we are entitled to identify the two brachycephalic "Celtic" races—that of Auvergne and that of the round barrows.

In any case it must be admitted that the popular usage of the word "Celtic" is unfortunate ; the Celts of history and ethnology having probably only an indirect linguistic relation to the Celts of philology. The blunder, if it is a blunder, cannot now be remedied ; to use the word Celtic in its strict historical and ethnological sense would be to introduce endless confusion. The word "Celtic" is too firmly established as a linguistic term to be now displaced, and it has therefore not been discarded in these pages. But if for convenience it has to be employed in its ordinary philological signification, it becomes all the more needful to find some other name for the short, dark, brachycephalic race who are claimed as the true Celts of ethnology and history.

From their physical resemblance to the Lapps, the term "Lappanoïde" has been proposed by Prüner-Bey. But as this involves the assumption of a genealogical relationship, which, though not improbable, is only an ethnological hypothesis, it will be better to select some other name. Rhætian, Savoyard, Breton, and Auvergnat have been suggested. Breton is objectionable, as, though the people of the southern part of Brittany are of this race, those of the northern coast were fugitives from the Saxon invasion of Wessex, and belong mainly, as Broca has shown, to the Silurian race. Auvergnat is better than either Rhætian or Savoyard, as Auvergne is in the heart of Cæsar's "Celtic" region. The term Ligurian is, however, very generally used on the ground that the modern Ligurians, who were never Celticized in speech, may claim to be the purest descendants of this race, having an index of 86, higher even than that of the Auvergnats.

The resemblance of this type to the Lapps cannot be overlooked. The mean cephalic index of the Auvergnats is 84 according to Broca, and 84.6 according to Durand. That of the Lapps is 84 by Prüner-Bey's measurements, and 85 by those of Broca. The Auvergnats also resemble the Lapps in their swarthy complexion and their black hair and eyes. But the chief reason for identification is that the Lapps and Auvergnats agree in having the smallest parietal angle of any existing races—that is, the head is abnormally narrow across the cheek bones, and wide at the temples. The mean parietal angle of

the Lapps is $5^{\circ} 30'$, with a minimum angle of -3° ; the mean angle of the Auvergnats is $2^{\circ} 30'$, with minimum of -5° . This peculiarity is seen in the front view of the skull of a girl found by Dr. Schliemann in the second or neolithic stratum at Hissarlik.



SKULL OF A YOUNG WOMAN FROM HISSARLIK (STONE AGE).

Among the Eskimo, whose heads are pyramidal, the mean parietal angle is as high as 15° , and it is 10° among the Guanches. All the Turanian races, with their broad cheek bones, have a high parietal angle.

Significant also, but less decisive, is the agreement in stature. The Lapps are the shortest race in Europe, their average stature being 5 feet 2 inches. The Auvergnats are not only the shortest race in France,* but the shortest race who now speak any Aryan language.

Attempts have been made to connect the Ligurians with the Finns rather than with the Lapps. The difficulty, or rather the facility, of such contentions arises from the fact that the Finns are not of homogeneous race. The stature, the color of the hair and eyes, and the cephalic indexes differ. Some of them resemble the Slaves, others approach the Swedes, and some share the characteristics of the Lapps,

* French conscripts who measure less than 5 feet $1\frac{1}{2}$ inches are exempted from serving. In the Department of the Puy-de-Dôme and the two adjacent departments, the Haute Vienne and the Corrèze, which are the home of the Auvergnat race, the exemptions are from 15 to 19 per cent., while in Belgic Gaul they are under 5 per cent. In the Auvergnat Departments the number of conscripts above 5 feet 8 inches is only 3 per cent.

whose language is an archaic form of Finnic speech. The Lapps, however, are orthognathous, and the Finns mostly slightly prognathous. Broca gives 80.39 as the mean index of the Estonian Finns, and 83.69 as that of the Finns of Finland. The mean stature of the Finns of Finland is given as 5 feet 3 inches.

There is less difficulty in determining the neolithic ancestors of the Ligurians. We must search the dolmens and sepulchral caves of Western Europe for a race combining short stature with a very high cephalic index.

The earliest vestiges of any people who answer to this description have been discovered at Grenelle near Paris.* Here, in the alluvium and the underlying gravels, deposited in a bend of the ancient bed of the Seine, skulls of three successive races have been found. The lowest, and therefore the oldest, beds of gravel contain skulls of the Canstadt or Scandinavian type, dolichocephalic and platycephalic, resembling the Stængenæs skull. In the alluvium which overlies the gravel, and at a depth of from 9 to 12 feet from the surface, there are dolichocephalic skulls of the Cro-Magnon or Iberian type. Above these, at a depth of from 4 to 7 feet, are the remains of a short brachycephalic race, quite different from the other two, with a mean stature of five feet 3½ inches, and a mean cephalic index of 83.6—measurements which accord very closely with those of the Auvergnats.

Farther to the north, certain limestone caves near Furfooz, in the valley of the Lesse—a small river which joins the Meuse near Dinant in Belgium—have yielded remains of one or possibly two short brachycephalic races. A cave called the Trou-Rosette† was inhabited

by a race with the high index of 86.1. In a neighboring cave, called the Trou-de-Frontal, skulls were found with indexes varying between 79.8 to 81.4. The mean index is 80.35, the mean index of five Estonian skulls at Paris being 80.35.

The stature of both of the Furfooz races was short. The tallest skeleton measured 5 feet 4 inches, the shortest 4 feet 11 inches. The mean stature of one race was 5 feet

2 inches; that of the other was just over 5 feet. The Trou-Rosette skulls bear a resemblance to those of the Lapps; the Trou-de-Frontal type, which may still be recognized among the inhabitants of the

* De Quatrefages, *Hommes Fossiles*, p. 72; Penka, *Origines Ariacæ*, p. 91; Hamy, *Précis de Paléontologie Humaine*, p. 252.

† Hamy, *Précis*, p. 354.



SKULLS FROM THE TROU-DE-FRONTAL.

valley of the Lesse, and among the peasants who frequent the markets of Antwerp, is more prognathous and nearer to the Finns.

Of the stage of civilization attained by the Grenelle race we know nothing; but the Furfooz races have left many traces of their industries in the caves which they inhabited, and in which they also buried their dead. They seem to have been a peaceful people, possessing no bows and arrows, or weapons for combat, but merely javelins tipped with flint or reindeer horn, with which they killed wild horses, reindeer, wild oxen, boars, goats, chamois, and ibex, as well as squirrels, lemmings, and birds, especially the ptarmigan.

Some of these animals, especially the reindeer, the ibex, the chamois, and the ptarmigan, prove that the climate was then subarctic. As the climatal conditions grew less severe some of these people may have followed the reindeer and the ptarmigan to more northern latitudes, while others accompanied the ibex and the chamois to the Alps, or conformed themselves, in the hilly regions of Central France, to new conditions of existence.

Their clothing consisted of skins, sewn together with bone needles. They tattooed or painted themselves with red oxide of iron, and wore as ornaments shells, plaques of ivory and jet, and bits of fluorspar. But the most noticeable fact is that the materials for their ornaments and weapons were brought from distant regions far to the south and south-west, which are now inhabited by a similar short brachycephalic race, while they seem to have been unable to avail themselves of the natural resources of the contiguous districts to the north and north-east, where the ethnic type is different. The flints for their implements were not obtained from the chalk formation of Hainault, a few miles to the north, but must have been brought from Champagne, and even from Touraine, more than 250 miles distant in a direct line. The jet came from Lorraine, and the shells from Grignon. Manifestly these people of the valley of the Lesse—some fifteen miles south of Namur—could range upwards of 300 miles to the south-west, but not more than twenty-five miles to the north, or they would have got their shells from Liège instead of from the Loire, and their flints from Hainault instead of from Champagne. Here, therefore, we recognize an ancient ethnic frontier. The people of the Lesse were unable to pass the line of the Sambre and the Meuse; the hills of Hainault must have been held by a hostile and more powerful race.*

That this was the case is also indicated by the fact that near Mons, forty miles north-west of the Lesse, deposits of flint instruments have been discovered, differing in type as well as in material from those found in the valley of the Lesse. The latter agree in type with those of the Dordogne in Central France, while the implements from Mons agree with those found in the valley of the Somme and other districts

* De Quatrefages, *Hommes Fossiles*, p. 74.

of Belgic Gaul. At a later time these distinctions disappear, the weapons are made of Hainault flint, and the types are the same as in the Hainault district.*

It would appear, therefore, that in the early neolithic age the Auvergnat race was pressed back in Southern Belgium by a more powerful northern people, who, we may conjecture, were the ancestors of the Belgic Gauls.

But while the Auvergnat race was in retreat on their northern frontier they were themselves encroaching on the territory of the feebler Iberian people to the south.

The artificial sepulchral grottoes of the Marne, excavated in the soft chalk of this region, form the transition between the natural caves used for sepulture on the Lesse, and the later dolmens of Central France. In these grottoes we find evidence that the brachycephalic people of the Lesse lived in peaceable association with the dolichocephalic Iberian race. They contain skulls with cephalic indexes varying from 71.65, which agrees with that of the Iberians, up to 85.71, which is that of the Furfooz people.

Three hundred miles farther south is the Department of the Lozère, now inhabited by the brachycephalic Auvergnat race. The Caverne de l'Homme Mort and other early sepulchral caves of this district contain only dolichocephalic skulls of the Iberian type.† But in the dolmens, which are of later date, M. Prunière has found numerous skulls of a pronounced brachycephalic type, mingled with a few decidedly dolichocephalic, and others of mixed type. Hence we conclude that the cave men were invaded by the dolmen builders. That the invaders met with resistance is proved by the fact that in some of the cave interments arrow-heads, of types believed to have been used only by the dolmen builders, are found embedded in the bones.‡ Hence De Quatrefages concludes that early in the neolithic age the dolichocephalic autochthones of this region were attacked by an intrusive brachycephalic race in a higher state of civilization; that the two races ultimately amalgamated; and that, finally, the dolichocephalic race was either absorbed or retired to the south-west, where, in the district between the Lozère and the Aveyron, there are dolmens containing only dolichocephalic skulls.§

It is believed that the Spanish Basques represent the earlier race, the Auvergnats the invaders, and the French Basques the mixed race.

The chief importance of these researches consists, as we shall hereafter see, in their bearing on the moot question of the linguistic affinities of the Basque speech.

The Auvergnats are separated from the Savoyards, who belong to

* De Quatrefages, *Hommes Fossiles*, p. 104.

† See p. 54, *supra*.

‡ De Quatrefages, *Hommes Fossiles*, p. 99.

§ *Ibid.*, p. 62.

the same type, by the valley of the Rhone, which is inhabited by a later intrusive race of much higher stature.

We are informed by Zosimus that there were "Celts" in Rhætia.* Here, consequently, if Broca's theory as to the Celts is correct, we ought to find traces of a people of the Auvergnat type. In the prehistoric graves of Eastern Switzerland, the ancient Rhætia, we find brachycephalic skulls which constitute what is called the Disentis type by the authors of the *Crania Helvetica*.† The mean cephalic index is 86.5, higher than that of any existing race. The nearest approach to it is 86, which Broca gives as the mean index of the modern Ligurians, and 85, which is that of the Lapps. A skull of the Disentis type was found in the neolithic stratum of the cone of the Tinière, to which an antiquity of from 6,000 to 7,000 years has been assigned by M. Morlot.‡

The pile dwellings in the lakes of Northern and Western Switzerland were, as we have seen,§ probably erected by the Helvetians, a people akin to the Umbrians and the Belgic Gauls.

The Helvetic and Rhætian skulls, though both brachycephalic, are very different. The first agree with those of the round barrow people of Britain, the second with those of the Ligurians, and to some extent with those of the Lapps.

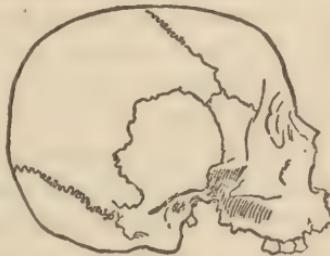
The mean index of ninety-five skulls from British round barrows is 81; that of seven skulls from the lake dwellings is 80.3. The index of the Disentis type varies from 81.8 to 97.5, the mean being 86.5. The index of the modern Lapps is 84 or 85, and it seems formerly to have been even higher, skulls from an ancient Lapp cemetery giving an index of 90.28. The mean cranial capacity of the round barrow people was 98 cubic inches, of the Helvetii 97, of the Rhætians 83. The Rhætians, like the Lapps, are orthognathous, while the round barrow people were prognathous.

The authors of the *Crания Helvetica* are of opinion that the Rhætian type is quite distinct from that of the British round barrows and of the Danish tumuli. On the other hand, Dr. Thurnam maintained that the brachycephalic races of Britain, France, and Denmark are cognate with the modern Finns. Professor Huxley goes further, and considers that the Disentis type, the South Germans, the Slaves, and the Finns, all belong to one great race of fair-haired, broad-headed Xanthochroi, "who have extended across Europe from Britain to Sarmatia, and we know not how much further to the east and south."

Professor Boyd Dawkins, in spite of the difference of stature, thinks

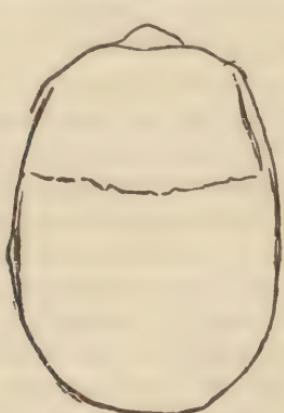
* Zeuss, *Die Deutschen*, p. 229. † His and Rütimeyer, *Crания Helvetica*, *passim*.

‡ See p. 34, *supra*. § See p. 50, *supra*.

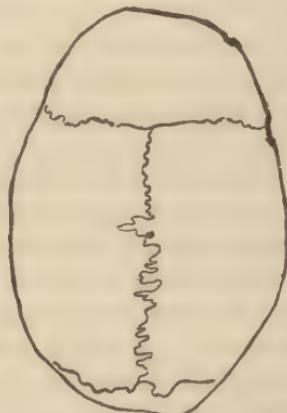


RHÆTIAN SKULL (DISENTIS TYPE).

the short Furfooz type is the same as that of the tall people of the round barrows of England, and of the neolithic tombs at Borreby and Moen.* With all deference to the opinions of these high authorities, it seems more in accordance with the evidence to class the tall people of the round barrows, who were almost certainly xanthous in hair and complexion, with the tall, red-haired Ugric race, and to class the short, brachycephalic race of France, Belgium, and Switzerland, who were almost certainly dark, with the Lapps, or possibly with some of the Finns. But as stature, prognathism, and the color of the hair and eyes are more variable characteristics than the shape of the skull and of the orbits, it is possible that the two brachycephalic types, the Celts of ethnology and the Celts of philology, may be remote branches of the same race, which, with Dr. Thurnam, we may call "Turanian." But for the purposes of the present inquiry it has seemed safer to consider them provisionally as distinct, more especially as the short, dark Ligurian race appear in Europe at a much earlier period than the tall, fair Celto-Slavic people. Certain linguistic theories bearing on the possible ultimate relationship of the two brachycephalic races will be discussed in a subsequent chapter.



SKULL FROM GENISTA CAVE,
GIBRALTAR.



DOLICHOCEPHALIC SILURIAN SKULL
FROM RODMARTON, GLOUCESTERSHIRE.

It has been already observed† that it is not impossible that the two dolichocephalic races may have descended, at some very remote period, from common ancestors. If, as De Quatrefages and Broca maintain, we may take the Cro-Magnon race as the ancestral type of the Iberians, and the Canstadt race as that of the Scandinavians, we find in the very oldest skulls a certain approximation of type. There was a time when the only inhabitants of Europe were dolichocephalic, and it is not impossible that the Neanderthal and Cro-Magnon people may have been descended from a common palaeolithic stock, and both

* Dawkins, *Cave Hunting*, p. 238.

† See pp. 59, 60, *supra*.

of the brachycephalic races from another. We should thus have only two primitive races to deal with, instead of the four which we recognize in tombs of the later neolithic age.

CHAPTER III.

THE NEOLITHIC CULTURE.

1.—*The Continuity of Development.*

THIRTY years ago, when the science of prehistoric archæology was in its infancy, the so-called "Finnic theory" was very generally accepted. The philologists having determined to their own satisfaction that the Aryans had migrated from Central Asia, the archæologists proceeded to identify them with the introducers of metal into Europe. They affirmed that prior to the Aryan migration neolithic Europe was occupied by Finnic races, who were encountered and exterminated by Aryan invaders armed with the bronze weapons which they brought with them from the East. It was also asserted that these Aryan invaders introduced most of our domesticated animals and cultivated plants, and were also in possession of an elaborate mythology, consisting chiefly of storm gods, dawn maidens, and solar heroes.

The evidence in support of these theories has now to be investigated, and we have to frame from the evidence of linguistic palæontology an account of the civilization attained by the undivided Aryans, and to compare it with the picture of neolithic culture as disclosed by the science of prehistoric archæology.

The theory that bronze weapons were introduced into Europe by a conquering people coming from the East has been overthrown, despite the arguments of M. Troyon,* by the evidence afforded by the Swiss lake dwellings, which establish the fact that bronze implements were gradually introduced among a neolithic population by the peaceful processes of barter. The successive "relic beds" superimposed one upon another prove that many of the lake settlements were founded in the age of stone, and passed through the age of bronze to the age of iron. No traces of any such hiatus as the Finnic theory demands have been discovered. The fact that with very few exceptions these lake settlements are exactly opposite to some modern town or village built upon the shore† shows that habitation has been usually continuous down to our own days. Evidently, as population increased, and

* Troyon, *Habitations Lacustres des temps anciens et modernes*. M. Troyon's conclusions are completely refuted by Keller, *Lake Dwellings*, p. 667.

† Keller, *Lake Dwellings*, p. 671.

life became more secure, the limits of the settlement were extended from the water to the land, and the pile dwellings, being no longer needed, gradually fell into disuse.

From an examination of the pile dwellings in the valley of the Po, Helbig has proved that the same gradual transition from stone to bronze took place among the Umbrians, an Aryan people. Here, however, at some time in the bronze age, the Umbrian civilization was suddenly overthrown by the invasion of the Etruscans, none of these Italian settlements reaching into the age of iron.

Thus the pile dwelling opposite Peschiera, on the Lago di Garda, was founded in the stone age, and was in continuous occupation through the age of copper to the age of bronze.* The remains of the settlement in the Lake of Fimon are specially instructive, as it must have been founded very soon after the Umbrians arrived in Italy, and was destroyed before they had passed from the pastoral to the agricultural stage. There are two successive relic beds, the oldest belonging entirely to the neolithic age. The inhabitants did not yet cultivate the soil, but subsisted chiefly by the chase. The bones of the stag and of the wild boar are extremely plentiful, while those of the ox and the sheep are rare. There are no remains of cereals of any kind, but great stores of hazel nuts were found, together with acorns, some of them adhering to the inside of the pipkins in which they had been roasted for food. The settlement seems to have been burnt, and then after a time rebuilt, the newer relic bed containing numerous flint chips and a solitary bronze axe. Cereals are still absent, although acorns, hazel nuts, and cornel cherries are found. But the pastoral stage had plainly been reached, since the bones of the stag and the wild boar become rare, while those of the ox and the sheep are common.†

These Italian settlements are of especial importance in our inquiry, as Helbig has satisfactorily proved that they were inhabited by the Umbrians, who spoke an Aryan language. We learn, therefore, that when the Aryans first reached Italy they were in the early pastoral stage, and were ignorant of agriculture and of metals.

We gather also that the knowledge of metals came from the South, and not from the East. Settlements exclusively of the stone age are found chiefly north of the Po, while those which contain bronze are mostly further south. It is the same in Switzerland. Settlements of the stone age are most numerous on the Lake of Constance; those of the bronze age on the lakes of Geneva, Bienne, and Neufchâtel.

Our own island formed the last refuge of the theory that Aryan invaders first introduced metal among a neolithic people. As late as 1880 Professor Boyd Dawkins maintained‡ that the round barrow

* Keller, *Lake Dwellings*, p. 363.

† *Ibid.*, p. 368.

‡ Dawkins, *Early Man in Britain*, p. 342.

invaders established themselves among the Silurian aborigines of Britain by the aid of the bronze weapons which they brought with them. But even in this, by far the strongest case, further investigation has shown the probability of the overlapping of the ages of bronze and stone. It has already been shown* that bronze is very rarely found in the primary interments of the round barrows, which, at all events in Yorkshire, belong more often to the age of stone than to the age of bronze. Moreover, in Britain, as elsewhere, the oldest bronze weapons are plainly modeled on the type of earlier implements of stone—forms which, being unsuitable for bronze, were soon abandoned.† The tombs which contain bronze weapons of these archaic forms not infrequently contain stone weapons as well. Thus, in a tumulus at Butterwick, in the East Riding of Yorkshire, a bronze celt of the very simplest form, modeled on the pattern of a stone axe, was found, accompanied by a flint knife.‡ In Derbyshire a skeleton was found buried in a hide, with the hair turned inwards, together with an implement of flint and a bronze celt of the plainest stone pattern. No fewer than twenty-seven bronze celts, modeled on the type of stone celts, have been found in England alone,§ and it is possible to trace the gradual development of the forms more suited to the new material from the forms suited to the old.

Hence it seems most probable that the Aryan invasion of Britain took place in the neolithic age.

These conclusions, which are now generally accepted by archaeologists, are fatal to the old theory that the Aryans were a comparatively civilized people, who invaded Europe from the East, bringing with them bronze weapons, which enabled them to subdue the aboriginal inhabitants of Europe who were of Basque or Finnish race. The knowledge of metals proceeded from the Mediterranean northwards, being mainly attributable to the gradual extension of Phoenician commerce.

In no part of Europe has it been proved that there was any interruption of continuity between the ages of stone and metal, and there is no evidence whatever to show that the present inhabitants of Europe are not descended from the people of the neolithic age, whose civilization was of a very rudimentary character. Hence the grounds on which a comparatively high degree of culture was assigned to the primitive Aryans will have to be reconsidered. The old conclusions were based on philology; but scholars are now inclined to rank the archaeological evidence as of chiefest value, and to assign to philology only a subordinate importance.

A good instance of the way in which the conclusions of philology as to early culture have been corrected by the more trustworthy evidence

* See p. 46, *supra*.

† See the engraving on page 82, *infra*.

‡ Greenwell, *British Barrows*, p. 187, Fig. 38.

§ Evans, *Bronze Implements*, p. 42.

of archæology is supplied by the parallel cases of the horse and the dog. The names of the horse (Sanskrit *āṣṭva*, the swift one) and of the dog (Sanskrit *śvān*) are found in almost every Aryan language ; and it was formerly supposed that the horse, a native of the steppes of Central Asia, was tamed by the primitive Aryans, and brought with them on their migration to the West.

Now in many of the very early stations, supposed to be palæolithic, such as those at Solutré and Thäyngen, the remains of the horse, associated with those of the reindeer, are extremely abundant, and the animal evidently formed a chief portion of the food of the people ; but the horse was manifestly wild. In the oldest of the neolithic Swiss lake dwellings the remains of the horse are absent, or very rare ; afterwards they become more common, and in the late bronze age the discovery of bits proves that horses had at last been tamed. Hence it is evident that the common Aryan name for the horse must have referred to the animal as an object of the chase, and has no more significance that the existence of the common names for the wolf and the fox.

With the dog, however, it is different. That the bones of dogs are found in the Danish kitchen middens by itself proves nothing ; they may have been eaten like the wolf and the fox, whose bones occur also in the refuse heaps ; but we conclude the dog had been domesticated, since those bones of birds and quadrupeds which are eaten by dogs are uniformly absent.* Hence it is evident that the conclusions of philology must be received with hesitation, unless they can be checked by evidence supplied by archæology.

The archæological discoveries of the last thirty years have placed the whole question of early Aryan civilization on a new footing.

In the kitchen middens of Denmark we find the refuse of the feasts of the rudest savages, ignorant of agriculture, subsisting mainly upon shell-fish, and possessing no domesticated animal except the dog.

In the oldest lake dwellings of Germany and Switzerland we find the remains of a people, believed to have been the ancestors of the Celtic race, usually in possession of cattle, but living mainly on the products of the chase. We trace them, during a period which must cover many centuries, at first clad only in skins, then learning to weave mats from the bark of trees, and finally from flax. We find them at first in possession only of the ox, and successively domesticating the goat, the sheep, the pig, and, last of all, the horse. We then see them acquiring by degrees considerable proficiency in agriculture, and passing gradually from the age of stone to the age of bronze, and from the age of bronze to that of iron. In the pile dwellings of Northern Italy we can in like manner trace the same gradual development of civilization, and the passage from the hunting stage through the pas-

* Lubbock, *Prehistoric Times*, p. 240 ; Lyell, *Antiquity of Man*, p. 15.

toral to the agricultural stage, and from the stone to the bronze age, of a people who are believed to have been the ancestors of the Umbrians, and closely related to the Latin race.

Dr. Schliemann's excavations at Mycenæ and Hissarlik belong to a later period of culture, and disclose the remains of nations unacquainted with iron, but possessed of a civilization splendid in its way, familiar with the uses of bronze, copper, and even of lead, and fabricating in great profusion highly artistic ornaments of gold, ivory, and silver.

It is plain that the civilization which we find in Europe at the beginning of the historic period was gradually evolved during a vast period of time, and was not introduced, cataclysmically, by the immigration of a new race. Just as in geological speculation great diluvial catastrophes have been eliminated and replaced by the action of existing forces operating during enormous periods of time, so the prehistoric archæologists are increasingly disposed to substitute slow progress in culture for the older theories which cut every knot by theories of conquest and invasion.

The most recent results of philological research, limited and corrected as they have now been by archæological discovery, may be briefly summarized. It is believed that the speakers of the primitive Aryan tongue were nomad herdsmen, who had domesticated the dog, who wandered over the plains of Europe in wagons drawn by oxen, who fashioned canoes out of the trunks of trees, but were ignorant of any metal, with the possible exception of native copper. In the summer they lived in huts, built of branches of trees, and thatched with reeds; in winter they dwelt in circular pits dug in the earth, and roofed over with poles, covered with sods of turf, or plastered with the dung of cattle. They were clad in skins sewn together with bone needles; they were acquainted with fire, which they kindled by means of fire-sticks or pyrites; and they were able to count up to a hundred. If they practiced agriculture, which is doubtful, it must have been of a very primitive kind; but they probably collected and pounded in stone mortars the seeds of some wild cereal—either spelt or barley. The only social institution was marriage; but they were polygamists, and practiced human sacrifice. Whether they ate the bodies of enemies slain in war is doubtful. There were no enclosures, and property consisted in cattle and not in land. They believed in a future life; their religion was shamanistic; they had no idols, and probably no gods properly so-called, but reverenced in some vague way the powers of nature.

This general picture of primitive Aryan culture has now to be substantiated in detail, and the gradual progress in civilization and the arts of life has to be traced from the scanty materials which we possess.

2.—*Metals.*

That the Aryans, before the linguistic separation, were still in the stone age may be inferred from the fact that no Aryan etymology has been found for the word "metal" (*μέταλλον*), which is regarded by Oppert and Renan as a Semitic loan-word obtained from the Phœnicians. There is no common word in Aryan speech to denote the art of the smith,* and many of the words relating to his trade refer primarily to stone. Each of the Aryan families of speech has an independent name for the smith, a sufficient proof that the arts of smelting and forging metal were later than the linguistic separation. More especially the old theory that the Celts were the vanguard of the Aryan race, who brought with them into Europe the knowledge of metals, falls to the ground, in face of the fact that the Celts have for the smith their own peculiar designation, *goba*, which bears no resemblance to the corresponding words in other Aryan languages, such, for instance, as the Latin *faber*, the Greek *χαλκεύς*, the Teutonic *smid*, or the Slavonic *vutri*.

The Ural-Altaic races must also have been in the stone age when they came into contact with the Aryans, since the name for the smith was borrowed by the Finns from the Lithuanians, by the Lapps from the Scandinavians, and by the Magyars from the Slaves.

It is a very suggestive fact that the Greek words for the apparatus of the smith—the names for the anvil, the bellows, the tongs, and the furnace—are not related to the corresponding terms in Latin.† Even among the Indians and Iranians, whose linguistic separation was so much later than that of the other Aryan races, these words also differ, with the single exception of the name for the furnace, which may primarily have denoted an oven used for other purposes. Not only are there no common Aryan words for the smith and his tools, but there is no common word for iron, or even for tin, a necessary constituent of bronze. Two metals only, gold and copper, are, as a rule, found in the metallic state. They were known both in Egypt and in Babylonia at the earliest period of which we have any historical cognizance, and in all probability they were the first metals with which the Aryans became acquainted. Native gold is very generally distributed, and native copper is found in Saxony, Hungary, Sweden, Norway, Spain, and Cornwall.

The glittering particles of gold found in the sands of so many rivers must have attracted attention at a very early period. But it is clear that gold was unknown to the undivided Aryans. The Greek *χρυσός* (Hebrew *chārutz*) being a Semitic loan-word, gold must have been first brought to Hellas by the Phœnicians, not earlier than the

* Schrader, *Urgeschichte*, pp. 221–225.

† Helbig, *Die Italiker in der Poebene*, p. 115.

thirteenth century B.C. We know that the Phoenicians mined for gold at Thasos. The tombs at Spata on Mount Hymettus in Attica, at Thera, at Mycenæ, and at Ialysos in Rhodes, contain objects exhibiting the influence of Phoenician art, and in all of them gold is more or less abundant. These tombs cannot in any case be older than the fourteenth or fifteenth century B.C., as at Ialysos, where the ornament is of the most archaic type, a scarab was found with the cartouche of Amenhotep III.* The probable date of the earliest of these tombs is the thirteenth century B.C. But gold was not known in Italy before the eleventh century B.C., since in the latest pile dwellings of the Emilia, which belong to the bronze age, and which even contain amber obtained by commerce from the Baltic,† neither gold nor silver has been found. In two or three of the Swiss pile dwellings of the bronze age, which survived to a later time than the pile dwellings of Italy, gold has very sparingly been found; in one instance only has a gold ornament been found in a settlement of the neolithic age.‡

That gold was unknown to the Aryans when they entered Italy may also be concluded from the fact that its name, *aurum* in Latin, and *ausum* in Sabine, is a word of Italic origin, denoting the "shining" metal, and related to the word *aurora*, the "shining" dawn.

The story of Brennus casting his sword into the scale to be weighed against Roman gold proves that gold must have been known to the Gauls not later than their invasion of Italy in 390 B.C. It is probable that it was not known to them at any earlier time, since the Celtic name (old Irish *ór*, Cymric *awr*) was borrowed from the Latin; and since the primitive *s* could not have changed to *r* in the Celtic speech, the word must have been borrowed after *ausum* had become *aurum* in Latin, a change which could not have been effected much earlier than the invasion of the Gauls.§

Gold must, however, have reached the Lithuanians, probably in exchange for amber, before it became known to the Celts, since the old Prussian name *ausis* (Lithuanian *auksas*) exhibits the earlier form of the Italic word. The Albanian *ári* proves that the Illyrians obtained their knowledge of gold at a somewhat later time, and also that they obtained it from Italy, and not from Greece.

Gold was known to the Indians before they entered India, and before their separation from the Iranians, since the Sanskrit name, *hranya*, is identical with the Zend *zaranya*, the word being also found in the other branches of the Iranian family—Afghan, Baluchi, and Ossetic. It must have been from the Iranians, probably from Scythic tribes belonging to the Iranian stock, that it penetrated to the Eastern Finns; the Mordwin, Wogul, Ostiak, Wotiak, Zyrianian, and Magyar

* Duncker, *History of Greece*, p. 53; *History of Antiquity*, vol. ii., pp. 63, 72, 73; Newton, *Essays on Archaeology*, p. 294. † Helbig, *Die Italiker in der Poebene*, p. 21.

‡ Keller, *Lake Dwellings*, p. 459.

§ Schrader, *Urgeschichte*, p. 251.

names, *sarni*, *sorni*, or *sirna*, being loan-words from the Iranian. The Teutonic name *gulth* means the "glowing" or "yellow" metal, and the form of the old Slavonic name *zlatō* proves that the Slaves must have borrowed the word from the Teutons at an early period. The Western Finns, however, must have obtained it from the Germans, as is shown by the Estonian name *kuld*, and the Lapp *golle*.*

Hence it appears that gold was not in the possession of the undivided Aryans, but was known to the Indians and Iranians before their separation, and possibly also to the undivided Slaves and Teutons.

Its introduction was later than the separation of the Greeks from the Latins, of the Latins from the Celts, and of the Eastern from the Western Finns. The Greeks obtained it from the Phœnicians, and the Celts, Illyrians, and Lithuanians from the people of Italy.

It was unknown to the Greeks before the thirteenth century, when the Phœnicians reached the coasts of Hellas; it was unknown in Italy in the eleventh century, when the Etruscan invaders destroyed the Umbrian settlements; but it had probably reached Italy as early as the ninth century, when the Greeks and Phœnicians had established themselves at Cumæ and Cære. It reached the Baltic before the fifth century, and Gaul and Illyria in the fourth. In Switzerland bronze was plentiful while gold was still unknown.

The discovery of copper must have preceded that of gold by many centuries. Not only the lake dwellings of Switzerland and Italy, but the Babylonian and Egyptian monuments prove that copper was the earliest metal to be discovered.

There is one Aryan word whose wide diffusion has to be explained, and which has been confidently adduced to prove that the undivided Aryans were acquainted with either bronze or copper.† This is the Sanskrit *ayas*, which corresponds with the Latin *æs*, the Gothic *aiz*, the German *erz*, and the English *ore*. The Latin *æs* denoted copper as well as bronze, the Gothic *aiz* meant brass or bronze, while the Sanskrit *ayas* is believed to have originally denoted copper, then metal in general, and afterwards iron. If copper was, as seems probable, the first metal to be discovered, it is easy to see that the name might have been generalized to denote metal, and then specialized to denote either iron, brass, or bronze. In any case the original meaning could not have been iron, since, for the linguistic and archæological reasons already stated, it is certain that the primitive Aryans had not reached the iron age.

That the metal designated by *ayas* or *æs* was copper and not bronze is also indicated by the fact that there is no common Aryan name for tin, which is a necessary constituent of bronze. The Greek name *χαστίτερος* is borrowed from the Semitic (Assyrian *kasazitirra*), which again is derived from the Accadian *id-kasduru*. Two small

* See Schrader, *Urgeschichte*, pp. 243-254.

† *Ibid.*, p. 267.

bars of tin have been found in Swiss pile dwellings of the bronze age, and also at Hallstadt, but tin has not been found at Hissarlik.

Lenormant has drawn attention to a curious fact, very difficult to explain. The oldest known word for copper is the Accadian *urud*, or *urudu*. Copper is *urraida* in Basque, *rauta* denotes iron in Finnic, and *rudu* means metal in old Slavonic, while *rōd* is brass in Beluchi, and *dru* is copper in the Semitic Babylonian. It is difficult to suppose that these resemblances can be merely accidental; and yet there are the strongest reasons for believing that both the Finns and the Basques were in the stone age when they came into contact with the Aryans, since the Basque word for knife primarily means a stone, and the Finnic names for smith are Aryan loan-words.

If the word *ayas*, *æs*, or *aiz*, is primitive, and if it meant copper, it is difficult to explain the entire absence of metal from the early Aryan settlements.

Three solutions are possible. It may have been a commercial loan-word, which is improbable. It may originally have denoted, not smelted metal, but ore—probably the lumps of iron pyrites found not uncommonly in neolithic tombs,* and which seem to have been used for procuring fire by striking them with flint, and may afterwards have come to denote the metal smelted out of such heavy stones. A third explanation finds favor with Dr. Schrader. He is inclined to consider the Latin *monile*, a word which reappears in the Indo-Iranian, Greek, Teutonic, and Slavonic languages, as an indication that copper rings, rudely beaten out with stone hammers from lumps of native copper, or obtained by barter from the East, may have been used as ornaments by the undivided Aryans.

The archæological evidence from the Swiss lake dwellings and elsewhere lends as yet no support to this theory, more especially as the earliest bronze celts—all those, for instance, found in the pile dwellings of Northern Italy—are cast and not hammered.† It is, however, possible that such copper rings were so rare and precious, being obtained only by barter from the distant East, that they do not happen to have been found.

At all events the Greeks, who were the most advanced in culture of the Aryan nations, seem to have been unacquainted with copper when they were first visited by Phœnician mariners. The Greek name for copper, *χαίρης*, is isolated in the Aryan languages. It has been supposed either to be a Semitic loan-word,‡ or, just as the Latin *æs cuprium*, the source of our word *copper*, was derived from the name of the island of Cyprus, so the Greek word *χαίρης*, copper, may have been derived from the Eubœan city of Chalcis, which itself may have taken

* Greenwell, *British Barrows*, p. 266.

† Helbig, *Die Italiker in der Poebene*, p. 19.

‡ Cf. Hebrew *chäläk*, smooth. Wharton, *Etyma Græca*, p. 132.

its name from the *xaλχη*, or purple murex, in quest of which the Phœnicians first resorted to the coast.* In either case the Greeks seem to have been ignorant of copper when the Phœnicians first reached their coasts.

That a copper age preceded the bronze age, and that *ayas* or *as* originally denoted copper rather than bronze, is also indicated by the fact that some of the oldest metal celts, which are imitations of the earlier stone celts, are of copper, not of bronze. In the museum at Berlin there is a copper celt, found in an Etruscan tomb, which is of the precise shape of an ordinary stone celt,† and even appears to have been cast in a mold formed by means of a stone implement of the same type. Celts of the simple flat stone type, without flanges, either of pure copper or of copper with so small a percentage of bronze as to be almost indistinguishable from copper, were found by Dr. Schliemann at Hissarlik, and by General di Cesnola in very early tombs in Cyprus. Flat celts of copper, of the stone type, have also been found in India, Austria, Hungary, France, and Italy.‡

In the pile dwelling at Maurach on the Lake of Constance, which belongs to the stone age, among fifty stone implements the only object of metal was a broken copper axe.§ At Sipplingen, also on the Lake of Constance, no bronze implements were found, but there were 350 stone axes, and one of copper, very simple in form, resembling the stone axes.|| And at Gerlafingen, also a settlement of the stone age, on the Lake of Bienne, were found two chisels of pure copper of the simplest stone type.¶

The figure represents the copper celt of the stone type from the lake dwelling at Sipplingen.

The recent explorations of the MM. Siret among the prehistoric tombs in the south-east of Spain have clearly revealed the existence of a copper age, intermediate between the stone and bronze epochs. Eighty axes of polished stone, and seventy flat copper axes of the stone type, were discovered in these tombs.

Dr. Evans explains the scarcity of copper implements by the supposition that on the discovery of bronze the copper implements were melted down and recast in bronze. But while in many parts of the Continent there is sufficient evidence that the bronze age was preceded by a copper age, there is no such evidence in Britain. It is therefore probable that bronze, introduced by traders from Gaul, was the first metal known in our island. Even as late as

* Schrader, *Urgeschichte*, p. 278. † Evans, *Ancient Bronze Implements*, p. 39.

‡ Evans, *Ancient Bronze Implements*, p. 40.

§ Keller, *Lake Dwellings*, vol. i., p. 121.

¶ *Ibid.*, p. 126, plate xxix.



COPPER CELT
FROM SIPPLINGEN.

Cæsar's time the Britons obtained their bronze by commerce from the Continent. The type of the British bronze weapons differs both from the Scandinavian and the Hungarian types, but agrees with the type characteristic of the north of France. The types in the Swiss lake dwellings agree with those of Northern Italy and the South of France.* Hence we conclude that the knowledge of metals penetrated gradually to the north from the Mediterranean lands which were visited by Phœnician ships.

Since silver rarely occurs in a native state, and is a difficult metal to reduce, we cannot be surprised to find that it was unknown to the primitive Aryans. The Celtic and Illyrian names were borrowed from the Latin, the Teutonic and Slavonic from the Semitic, while the Latin, Greek, and Sanskrit names were independent formations. It was probably unknown to the Celts before they invaded Italy, as the Celtic name (old Irish *argat*) is an Italic loan-word (Latin *argentum*, Oscan *aragetud*). This word is from the Aryan root *arg*, and means the "white" or "bright" metal. In Greek, Sanskrit, and Zend the name is formed from the same obvious root, but with a different suffix, showing an independent invention of the word. The two earliest sources of silver seem to have been Armenia and Spain. In the south-east of Spain, where silver occurs in a native state, ornaments of this metal have been found in tombs of the early bronze age. It seems to have become known to the Greeks, probably through Phœnician commerce, shortly before the Homeric period. Dr. Schliemann found silver in the tombs at Mycenæ, which are of the Phœnician-style of architecture, and he discovered electrum, a natural alloy of gold and silver, in the second and third strata at Hissarlik. Silver has not been found in the oldest Phœnician tombs in Greece, which may date from the twelfth century B.C., nor as yet in the Italian pile-dwellings of the bronze age.† But in some of the latest of the Swiss-pile dwellings of the iron or late bronze age, probably dating from the fourth or third century B.C., three or four silver ornaments have been discovered. In the time of Herodotus silver was unknown to the nomad Aryan tribes north of the Euxine; but the northern name (Gothic *silubr*), which is common to Lithuanians, Slaves, and Teutons, is believed to be a loan-word from the Semitic (Assyrian *sarpu*)—an indication that the Baltic nations first obtained it by the trade route of the Dnieper from the region of the Euxine.‡

Hence we gather that it reached the Greeks earlier than the tenth century, and the Celts not before the fifth.

There can be no question that the age of iron was later than the age of bronze. The Greek words *χαλκεύς*, a smith, and *χαλκεών*, a

* Evans, *Ancient Bronze Implements*, pp. 482-484.

† Helbig, *Die Italiker in der Poebene*, p. 21.

‡ Schrader, *Urgeschichte*, pp. 256-265.

smithy, are derived from the name of copper, not of iron. The pile dwellings in the valley of the Po belong to the ages of stone and bronze, but afford no trace of iron. Hence we obtain an approximate limit for the introduction of iron into Italy. Helbig has shown good reasons for believing that these settlements must be assigned to the Umbrians, an Aryan people, and that they were destroyed at the time of the Etruscan conquest of Northern Italy. Now, according to a tradition preserved by Varro, the Etruscan era began in 1044 B.C., a date which agrees roughly with that assigned to the Thessalian and Dorian invasions of Greece, with which it was probably connected, while the Dorian inroad led to the Moesian settlements of Æolian, Achæan, and Ionian tribes, dim memories of which lie at the base of the Homeric epos. These events clearly occurred towards the close of the bronze age. Iron was unknown to the Umbrians of Northern Italy at the time of the Etruscan inroad. The third or burnt city at Hissarlik, which Dr. Schliemann identifies with the Homeric Troy, was also in the bronze age; and in none of the five prehistoric cities at Hissarlik are there any vestiges of iron. Iron, however, plays a considerable part in the *Iliad*—another proof, if proof were wanted, of the comparatively late date of the Homeric poems, and also affording a rude but valuable indication of the limits of date between which iron must have become known to the Greeks. Again, the great tombs discovered by Dr. Schliemann at Mycenæ must be assigned to that earlier period of Greek civilization which was overwhelmed and destroyed by the rude Dorian conquerors. In the excavations at Mycenæ iron knives were found, but only in certain late deposits, which are assigned by Dr. Schliemann to the fifth century B.C. Hence three concurrent lines of evidence tend to show that iron was unknown in Argos, Moesia, and Northern Italy in the twelfth or eleventh century B.C.

In the time of Homer the age of iron was just commencing in Greece. He constantly mentions bronze weapons, while iron is still a rare and precious metal. Hesiod, *circa* 850 B.C., refers to a time when bronze had not yet been superseded by iron, which had already become commoner and cheaper than copper, as was the case in Assyria in the eighth century B.C. Homer mentions seven metals—gold, silver, lead, tin, copper, bronze, and iron. He also mentions the smith, the anvil, the hammer, and the pincers. Iron was at first chiefly used for swords, as Hesiod gives Heracles a sword of iron, but even down to the time of Pindar (*circa* 470 B.C.) bronze was still used for certain weapons, as he repeatedly mentions spear-heads and axes of bronze.

Another indication of date is afforded by the Italic name of iron. The Latin word *ferrum*, which points to an earlier *fersum*, is isolated in Aryan speech, and is believed to be a loan-word from the Semitic

bar(e)zum, an indication that the metal was first introduced into Italy by Phœnician traders. The Phœnicians must have reached Sicily about the twelfth century,* and soon afterwards established a trading station in Central Italy, probably at Cære.

Like the Latin *ferrum*, the Greek name of iron, *σιδηρος*, is isolated in the Aryan languages. Dr. Evans compares this with the Latin *sidera*, and suggests a reference to meteoric iron.† But as Semitic and Greek tradition both point to the land of the Tibareni on the shores of the Euxine as the earliest source of iron, Dr. Schrader is of opinion that the Greek name may be a loan-word from one of the languages of Asia Minor.

In any case the knowledge of iron must have been derived from the East. It is denoted in the Semitic languages by a word borrowed from the Accadian. In Egypt it was known as early as the twelfth dynasty. But the knowledge of copper must have preceded that of iron, since the sign for copper is used as a determinative or generic sign for the word *men*, iron, while the copper mines in the Peninsula of Sinai were worked by the Egyptians as early as the second or third dynasty, and by the Babylonians probably at the time of the sixth.

Another curious indication of the relative priority of iron and copper, as well as of the locality where iron was first smelted in Northern Europe, is afforded by the history of our own word "iron." In Gothic, as we have seen, *aiz* meant brass or bronze, while iron is denoted by the derived word *cisarn*. But the suffix *arn* is distinctively Celtic, and hence the Teutons must have derived their knowledge of iron from their Celtic neighbors. Out of *aiz*, "bronze," the Celts must have constructed the derivative *aisarn*, and then, in accordance with a well-known euphonic law of the Celtic languages, the *s* fell out between two vowels, leaving for iron the name *iarn* in old Irish, and *haiarn* in old Welsh. But before this loss of the sibilant, the Celtic word must have found its way into Teutonic speech, iron being denoted by *cisarn* in Gothic, *isern* in Anglo-Saxon, *isarn* in old Norse, *eisen* in German, and *iron* in English.‡

The evolution of the Teutonic and Celtic names for iron must have taken place in some region where iron ores were abundant, and where Celts and Teutons were in approximate contact, and also not far from the primitive seat of the Goths on the southern shores of the Baltic. Hallstatt, where iron has been found in the prehistoric salt-workings of a Celtic people, is probably too far to the south; but all the conditions of the problem are found united in the region of the Erzgebirge, which divide Bohemia from Saxony. As the name implies, these mountains are rich in metallic wealth, while down to the

* Duncker, *History of Antiquity*, vol. ii., p. 87.

† Evans, *Ancient Stone Implements*, p. 6.

‡ Schrader, *Urgeschichte*, p. 293.

first century B.C. they formed the ethnic frontier between Celts and Teutons. Here most probably we may locate the earliest iron manufacture in Northern and Western Europe. This must, however, have been as early as the fifth century B.C., as the Gauls possessed iron swords when they invaded Italy.

The Slavonic and Lithuanian name for iron is also derived from a word denoting copper. The Slavo-Lithuanian name for iron is *gelezis*, and the probable source of this word is the Greek *χαλκός*, copper or bronze. The knowledge of metals must have reached them from the Greek trading colonies of the Euxine, probably about the sixth century B.C. In the time of Herodotus the Scythians had no bronze, but the Massagetae had gold and copper, but neither iron nor silver.*

There is no common Aryan name for lead. The knowledge of lead must, however, have preceded that of iron, since lead was abundant at Mycenæ, which was in the bronze period, and lead occurs in all the five prehistoric strata at Hissarlik, in none of which any iron has been found.

As for salt, Benfey, Schleicher, and Max Müller have asserted, on linguistic grounds, that it was known to the undivided Aryans. The name runs through the European languages, but its existence in Indo-Iranian is disputed. The word *sara* means "water" in Sanskrit, but Hehn maintained that this is no sufficient proof that the Indians were acquainted with salt. Curtius and Benfey observed that the Sanskrit word is employed in the sense of "briny," to which Bohtlingk replied that this signification does not appear at any earlier date than in a Sanskrit dictionary of the twelfth century A.D., and therefore proves nothing.†

As for any absolute dates for the introduction of the various metals, the calculations that have been made can be regarded as only approximate. Besides, while one nation was in the stone age, another may have been acquainted with bronze, and a third with iron. Besides, the introduction of each metal was very gradual. Arrows continued to be tipped with flint or bone long after bronze was used for other weapons. Arrows are more liable to be lost, and therefore flint was preferred when metal was costly. Flint arrow-heads are frequently found in barrows, together with bronze celts.‡

From the gradual improvement in the types of the bronze implements, Dr. Evans thinks that the bronze age must have lasted for many centuries—eight or even ten; but this estimate would have to be extended if M. Morlot is right in assigning certain bronze implements found in the cone of the Tinière, near the head of the Lake of Geneva, to about the year 1900 B.C.

* Evans, *Ancient Bronze Implements*, p. 17.

† Schrader, *Urgeschichte*, p. 56.

‡ Evans, *Ancient Stone Implements*, 328, 353.

It is thought that gold and copper may have been known to the Indo-Iranians as early as 2000 B.C.* The Greeks were probably acquainted with bronze before the thirteenth century B.C., with gold as early as the twelfth, with silver not before the eleventh, and with iron before the ninth century.

In Italy bronze had certainly been known for a considerable period before the eleventh century, possibly as early as the ninth. Gold was not known in the eleventh century, and iron not before the tenth.

Dr. Evans places the beginning of the bronze period in Britain between 1400 and 1200 B.C., and Sir John Lubbock between 1500 and 1200 B.C.—estimates which give us a minimum date† for the appearance of the round barrow Aryan-speaking people in our island. Dr. Evans thinks iron swords were used in Gaul in the fourth or fifth century B.C., and in the south of Britain a little later. He considers that, in the third or second century B.C., bronze had practically fallen into disuse for cutting implements.‡

Iron probably became known to the Slaves and Teutons in the sixth or fifth century B.C., and to the Celtic peoples of Central Europe somewhat earlier. In the time of Pausanias, 174 A.D., we are told that iron was unknown to the Sarmatians.

3.—*Weapons.*

The names of weapons, though they differ as a rule in the Aryan languages, occasionally afford proof of a descent from the stone period. Thus the old Norse *sax*, the old High German *sahs*, the Anglo-Saxon *seax*, a sword, is plainly related to the Latin *saxum*, a stone, and the Iranian *asti*, arrows, is related to the Latin *os*, a bone, and proves that the primitive arrows were tipped with bone and not with bronze or iron. Even during the late bronze period in Europe, the arrow-heads were of flint or bone, bronze being too valuable a metal to be shot away and lost.

It is noteworthy that while the European words connected with pastoral and agricultural pursuits agree to a considerable extent, those for weapons are mostly different. The Greek and Latin designations for bow, arrow, sword, spear, shield, helmet, and armor are unconnected, while on the other hand the Greek words for bow-string, arrow, spear, sling-stone, battle-axe, and shield can be traced in Sanskrit. One Italic word, *ensis*, which originally denoted a knife—doubtless of stone—rather than a sword, is the only Latin name for a weapon which can be traced in the Indo-Iranian tongues. The *ensis* was a stabbing weapon, the cutting sword being designated in Latin

* Duncker, *History of Antiquity*, vol. iv., p. 30; Evans, *Ancient Bronze Implements*, pp. 471, 472.

† See p. 128, *supra*.

‡ Evans, *Ancient Bronze Implements*, pp. 471, 472.

by the word *gladius*, which is believed to be a loan-word from the Celtic (old Irish, *cláideb*; Cornish, *cledyf*). The legend of Brennus makes it probable that the *gladius* became known in Italy after the invasion of the Gauls. It was much the same in Greece. No trace of a sword has been found in any of the prehistoric strata at Hissarlik, which is itself a proof of the late date of the *Iliad*. The Homeric name *ξιφός* being a Semitic loan-word (cf. the Arabic *seifun*) is an indication that the Greek sword was obtained from the Phœnicians, as the Roman sword was from the Gauls. The Roman *lorica* was made of leathern thongs, and the shield, *scutum*, was, as the name implies, originally an ox-hide. The Greek names prove that the primitive shields were made of hydes or wicker-work, and that the helmet was at first merely a cap of dogskin. The names of weapons common to Zend and Sanskrit prove that the Indo-Iranians, before their separation, must have been acquainted with the bow, the spear, the javelin, the sword, the knife, the battle-axe, and the club, but only with one defensive weapon, the shield. The terms for defensive armor, mail and helmet, are later than the separation of Indians and Iranians.

The bow, a favorite weapon with the Southern and Eastern Aryans, seems to have been of late introduction in the North, the German *pfeil*, arrow, being a loan-word from the Latin *pilum*, while the old Irish *saiget*, arrow, is a loan-word from the Latin *sagitta*.

The chief Northern weapon seems to have been the stone axe or hammer. So late as the thirteenth century Sir William Wallace went into battle against the English armed with a celt or stone axe; and weapons of stone seem to have been used by Harold's armed peasants at the battle of Hastings.*

4.—Cattle.

The sepulchral caverns and dolmens of France and Belgium prove that, at the beginning of the neolithic age, the inhabitants of Europe were nomad hunters, sheltering themselves in caves, subsisting on the products of the chase, and possessed of no domesticated animal. In the kitchen middens of Denmark we find that the first onward step in progress had been made, and the dog had been trained as an assistant in the chase. The oldest lake dwellings of Southern Germany exhibit a further stage in culture. The people had fixed dwellings constructed with considerable skill, and we can trace their gradual progress from the life of the hunter to that of the herdsman.

The wild horse, which roamed in immense herds over the plains of Europe, and had formed the chief food of the people who sheltered themselves in the caverns at Solutré, Auvernier, Salève, and Thäyngen,

* Helbig, *Die Italiker in der Poebene*, p. 42. See, however, Evans, *Ancient Stone Implements*, p. 132.

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